

PRIMARY 2

MATHEMATICS

Teacher's Guide
2019/2020

Term 2

FOREWORD

This is a pivotal time in the history of the Ministry of Education and Technical Education (MOETE) in Egypt. We are embarking on the transformation of Egypt's K-12 education system starting in September 2018 with KG1, KG2 and Primary 1 continuing to be rolled out year after year until 2030. We are transforming the way in which students learn to prepare Egypt's youth to succeed in a future world that we cannot entirely imagine.

MOETE is very proud to present this new series of textbooks, Discover, with the accompanying digital learning materials that captures its vision of the transformation journey. This is the result of much consultation, much thought and a lot of work. We have drawn on the best expertise and experience from national and international organizations and education professionals to support us in translating our vision into an innovative national curriculum framework and exciting and inspiring print and digital learning materials.

The MOETE extends its deep appreciation to its own "Center for Curriculum and Instructional Materials Development" (CCIMD) and specifically, the CCIMD Director and her amazing team. MOETE is also very grateful to the minister's senior advisors and to our partners including "Discovery Education," "Nahdet Masr," "Longman Egypt," UNICEF, UNESCO, and WB, who, collectively, supported the development of Egypt's national curriculum framework. I also thank the Egyptian Faculty of Education professors who participated in reviewing the national curriculum framework. Finally, I thank each and every MOETE administrator in all MOETE sectors as well as the MOETE subject counselors who participated in the process.

This transformation of Egypt's education system would not have been possible without the significant support of Egypt's current president, His Excellency President Abdel Fattah el-Sisi. Overhauling the education system is part of the president's vision of 'rebuilding the Egyptian citizen' and it is closely coordinated with the ministries of higher education & scientific research, Culture, and Youth & Sports. Education 2.0 is only a part in a bigger national effort to propel Egypt to the ranks of developed countries and to ensure a great future to all of its citizens.

WORDS FROM THE MINISTER OF EDUCATION & TECHNICAL EDUCATION

It is my great pleasure to celebrate this extraordinary moment in the history of Egypt where we launch a new education system designed to prepare a new Egyptian citizen proud of his Egyptian, Arab and African roots - a new citizen who is innovative, a critical thinker, able to understand and accept differences, competent in knowledge and life skills, able to learn for life and able to compete globally.

Egypt chose to invest in its new generations through building a transformative and modern education system consistent with international quality benchmarks. The new education system is designed to help our children and grandchildren enjoy a better future and to propel Egypt to the ranks of advanced countries in the near future.

The fulfillment of the Egyptian dream of transformation is indeed a joint responsibility among all of us; governmental institutions, parents, civil society, private sector and media. Here, I would like to acknowledge the critical role of our beloved teachers who are the role models for our children and who are the cornerstone of the intended transformation.

I ask everyone of us to join hands towards this noble goal of transforming Egypt through education in order to restore Egyptian excellence, leadership and great civilization.

My warmest regards to our children who will begin this journey and my deepest respect and gratitude to our great teachers.

Dr. Tarek Galal Shawki
Minister of Education & Technical Education

Contents

How to Use This Guide



The Mathematics Teacher Guide is designed to support instructors in the preparation and implementation of rich and engaging learning experiences. It provides clear step-by-step instructions embedded with teacher input, instructional strategies, and classroom management techniques. In these learning experiences, students explore, play, use manipulatives, communicate and collaborate with colleagues, ask and seek answers to questions, and practice new skills and concepts.

This instructional approach aims to help students accomplish the following goals:

- Build numeracy
- Discover connections between and among math concepts
- Develop computational skills
- Acquire and use math vocabulary
- Build awareness of measurement concepts and geometric shapes
- Enhance critical thinking, problem solving, collaboration, and communication
- Increase enjoyment of math

If instructors have not used such a guide before, some practical advice follows:

- Read each chapter carefully. Make notes and highlight important details.
- Take particular note of sections labeled Term, Chapter, or Lesson Preparation. These sections include steps the teacher will need to complete in order to implement the learning experiences in the term, chapters, and lessons. Advance preparation will ease the instructor's workload and ensure successful learning experiences for students.
- Gather the necessary materials and make any preparations before implementing the lessons.
- Consider additional classroom management techniques necessary for your particular class and learning environment.

There is a Mathematics Student Book for Primary 2. The student book contains Apply pages and Math Journal pages.

Apply pages:

- Apply pages provide an opportunity for students to immediately practice the content they are learning in class.
- Students work independently, in pairs, and in small groups to explore, discover, and apply new skills and concepts.
- Students have multiple opportunities to check their work and the work of others. This kind of error analysis strengthens students' learning and deepens their understanding of mathematical concepts and connections.
- Apply pages are a wonderful resource for informally assessing student progress.

Math Journal pages:

- Students reflect on their learning through drawing, writing, and completing related math activities.
- The Math Journal pages provide opportunities for students to make connections between new content and previous learning and between formal math concepts and the real world.
- Like the Apply pages, the Math Journal pages are a great resource for informally assessing student progress and gathering information about students' current understanding and potential misconceptions.

The information you gather from the Apply pages and the Math Journal pages can be used to plan future instruction and differentiation (see Formative Assessment, below).

Take note of the following:

- What are students discovering or learning? (Content)
- What are students' misconceptions or misunderstandings? (Remediation)
- What are students being asked to do? (Activity)
- What is the teacher discovering about students? (Assessment)
- How could you adapt the lesson for the different abilities in your class? (Differentiation)

During and after implementing each lesson, reflect and make notes on what was successful as well as possible suggestions for improvement.

Planning with another instructor can often lead to greater implementation success as it provides an opportunity to discuss classroom expectations, management procedures, and strategies for differentiation according to the needs of students. It is suggested that teachers meet with other instructors at least weekly to plan and reflect.

Background

Building off the success of the initial year of Education 2.0 implementation, these instructional materials support the production of engaging and rigorous learning experiences for students and teachers. In this Teacher Guide, mathematics instruction is divided into Chapters. Each Chapter includes 10 days of instruction. The teaching of mathematics and the building of numeracy is very linear, with students learning new content in increments, and adding to their conceptual development and understanding slowly over time.

Lesson organization
Mathematics lessons are organized into three components:

- **Calendar Math (15-20 minutes)**
  - During this daily routine, students develop number sense, early place value concepts, counting fluency, and problem-solving skills. This segment also provides an opportunity for students to review and practice previously-learned skills and concepts.

- **Learn (35-40 minutes)**
  - During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.

- **Reflect (5-10 minutes)**
  - During this daily routine, students develop their ability to connect and express mathematical ideas. Students may communicate their mathematical thinking through partner or whole group discussion or through writing or drawing on Math Journal pages.

The following components of Calendar Math should be taught every day, whether or not you are teaching a full mathematics lesson:
- Current month
- Current day
- Today's date: Today is (day of week) the (date) of (month) (year).
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

Some instructional considerations
Each section should be implemented every day. However, in some cases, students may need a few more minutes for one section and another section (or two) will have to be shortened for that day. The instructor should use personal judgment and knowledge of student needs to allocate lesson time.

Story problems and numbers are provided as examples. The instructor can use the story and numbers provided or create stories of their own. If the numbers in a story problem or sample problem are changed, be sure to limit the quantities to those identified in the indicators and outcomes (for example, "up to 1000").

The instructor is encouraged to incorporate familiar counting songs, poems, rhymes, math stories/literature, and math games and activities that are not included in this Teacher Guide.



Learn more about Education 2.0

Instructional Strategies

Many of the instructional strategies described below are woven throughout the Teacher Guide. These are not meant to be the only methods used in the classroom; rather they are highlighted as best practices for engaging students in active, inquiry-based learning. As teachers and students gain familiarity with the strategies, instructors may wish to modify and personalize to suit the needs of each individual classroom.

For more strategies visit: tinyurl.com/Edu2-0strategies



INSTRUCTIONAL STRATEGY NAME	BRIEF DESCRIPTION
2 Stars and a Wish	This strategy is used to help students give positive feedback to peers. Two stars are two things the student likes about the work that is being evaluated. One wish is a suggestion to improve upon that work.
Aha/Hmm?	Students write one or two "ahas," or something new that was learned and one "hmm?," or question they still have. This strategy is an opportunity for students to reflect on and take ownership of their learning.
Ask 3 Before Me	Students ask three peers for assistance before asking the teacher. This strategy is used when students are working collaboratively to develop communication skills, encourage peer interactions, and decrease reliance on the teacher's support in large classrooms.
Attention Getting Signal	The teacher uses an explicit signal to get the attention of the class when they are talking in pairs or working in groups. There are many options for signals, and more than one can be used as long as students recognize it. Options include a clap pattern that students repeat, a simple call and response phrase, or a hand in the air (see: Hands Up). This strategy allows teachers to ask for students' attention without shouting or immediately disrupting student conversations.
Brainstorm	Students provide multiple answers for an open-ended question. This can be done as a whole class or in groups or pairs. The purpose of a brainstorm is to list many answers, not to critique whether answers are realistic, feasible, or correct. Once an initial broad list is made, students can go back to answers to prioritize or eliminate some options. This strategy promotes creativity and problem-solving.
Calling Sticks	The teacher writes the names of students on popsicle sticks and places them in a can/jar. To call randomly on students, the teacher pulls a stick from the jar. After calling on the student, the teacher places that stick into another can/jar so that student is not immediately called on again. This strategy helps teachers call on a wide variety of students and encourages all students to be ready with an answer.
Count Off	The teacher breaks students into groups by having students count off to a certain number. It is important to tell students to remember their number. For example, if the teacher wants three groups, the first student counts 1, the next student says 2, the next says 3, and the next student starts over at 1, and so on. When all students have counted, the number 1s all form one group, the number 2s form another group, and the number 3s form a third group. This strategy enables time-efficient grouping and reinforces conceptual number use.

INSTRUCTIONAL STRATEGY NAME	BRIEF DESCRIPTION
Fishbowl	Students gather around a teacher or group of students who are modeling something new. The students observe carefully as if they are watching fish in a bowl. This strategy promotes the full attention of students even when individual students are not actively participating in the demonstration.
Four Corners	Each of the four corners of the room corresponds to a possible topic or opinion about a thought-provoking statement. The teacher may post a picture or a prompt in each corner of the room to represent the opinions/statements. Students walk to the corner that interests them or expresses their opinion in order to group with other like-minded students. This strategy allows students to express opinions and to prepare justifications with others who agree before presenting to the class.
Gallery Walk	As if in a museum, students walk past displays and respond to questions or prompts about the display. This strategy can be used in multiple ways, including to consider ideas posted on chart paper around the room or to view classmates' final products. This strategy encourages diversity of thought. When used at the end of a project, this strategy allows students to celebrate and take pride in their work while also honoring and responding to others' work.
Hands Up	The teacher holds a hand in the air to signal that students should stop what they are doing, stop talking, and look up at the teacher. When students notice the teacher's hand up, they also raise a hand to signal other classmates. This strategy is used as an attention-getting signal.
Hands Up, Pair Up	Students stand and walk around the room quietly with one hand raised in the air. The teacher says, "Stop—Pair Up." Students clap hands and stand together with a nearby student. Anyone with a hand still up needs as a partner. Students can easily find each other and pair up. This strategy allows students to move around the room and share or speak with multiple peers.
I Do, We Do, You Do	I Do: Teacher demonstrates or models an action to take place, such as reading a passage to the students. We Do: Students repeat the action with the teacher, such as re-reading a passage in unison. You Do: Student practices the learned action without the guidance of the teacher. This strategy supports students by modeling an expectation, allowing for low-pressure practice, then providing opportunities for independent practice.
I See Very Clearly	The teacher tells students he/she sees something. Students guess what it is as the teacher gives students clues. Students use observation and listening skills to guess the correct object. This strategy emphasizes the use and identification of object properties and characteristics.
Imagine That	The teacher describes a person, animal, plant, or situation for students to act out. Students imagine that they are the living thing or are in the situation and act out what happens. This can also be done in groups with a student, or rotating students, acting as the leader. This strategy promotes imagination and long-term memory.
experts	Students work cooperatively within small groups to complete tasks, then teach other groups what they have learned. The teacher organizes students into groups. Each student within the group is given specific information to learn and will become an 'expert' on that information for their group. Students then join with those of other groups assigned the same piece of information. These students work together to read a passage, research, and learn about the assigned information. Students then return to their original groups to share their learning. For example, a long passage of information may be broken up into smaller sections, with each student in a working group assigned to read one section. The students from every group assigned the same section form an “expert” group, and read that section together. Students then reconvene in their working groups to report the information learned back to the group. In this example, students are responsible for teaching others in their group about specific information. This instructional strategy builds collaboration, communication, and thinking skills.

INSTRUCTIONAL STRATEGY NAME	BRIEF DESCRIPTION
Lean and Whisper	Students lean one shoulder in toward one neighbor to whisper the answer to a question that has a one- or two-word (short) answer. This strategy engages all students in answering a question without disrupting the flow of the classroom. This can be used as a specific type of the Shoulder Partner strategy.
Model	The teacher or a student demonstrates how to complete a task. The rest of the class can ask questions before repeating what was demonstrated. This strategy allows the teacher to review any safety concerns or difficult aspects of a task, as well as share advice for task completion. This method should not be used for some inquiry activities, as it could over-influence the direction of student thinking.
Number Sign	The teacher can check for understanding quickly by asking a question and giving students a choice of answers. Students hold up one, two, or three fingers in response to the question asked. The teacher quickly scans the fingers raised to get a sense of how many students are tracking the material.
Numbered Heads Together	This is a cooperative strategy that holds each member of a group accountable for learning/ discussing material. Each student in the group is given a number. The teacher poses a question to the group. Students put their heads together to discuss the answer. The teacher then calls a number to identify a "spokesperson" to share the group's answer.
On the Fence	Each of the two sides of the room corresponds to a possible opinion about a thought-provoking statement. The teacher may post a picture or a prompt on each side of the room to represent the opinions/statements. Students walk to the side that interests them or expresses their opinion to group with other like-minded students. Students may also stay "on the fence" in the middle of the room if they are undecided. Students debate their opinion with evidence to persuade others in the room to agree with them. As students change their minds, they move to the corresponding area in the room.
One Stay One Stray	After working with partners, one person stays with the work product to present to other students while the second partner walks around and listens to peers in the class share. Then the two students switch roles. Using the strategy, both partners get to share their project and listen to others share.
Pass the Pen	Students work collaboratively in a group with one pen or pencil per group. The teacher poses a question or topic to groups. One student writes down an idea or answer, then passes the pen to the next group member. The pen continues to be passed around, allowing all students an opportunity to write at least once or twice. This strategy is used to brainstorm or activate prior knowledge on a topic and is helpful for encouraging all students to participate and share ideas.
Popcorn	Call on one student to answer a question. After the student has answered the question, they say "popcorn" and the name of another student. It is now the turn of that student to answer the question, then pick a new student, and so on. If a student has responded, they should not be called upon a second time during the same Popcorn.
Relay Race	Divide the class into teams and have them line up single file. Call one student from each team to the front of the class. Ask students a question. The first to answer receives a point for their team. After answering, that student goes to the end of the line and the next student goes to the front of the room. A variation for math problems is for students to complete only one part of a math problem at a time.
Shake It Share It High Five	Students move around the classroom until the teacher signals to stop. Students then partner with a nearby student. Partners shake hands, share ideas or work products, then high five before moving around again to find a new partner. This strategy gets students out of their seats and moving, while also allowing them to share with classmates they do not sit near.

INSTRUCTIONAL STRATEGY NAME	BRIEF DESCRIPTION
Shoulder Partners	Students lean and talk quietly with the person sitting next to them. Shoulder Partners can be used literally to just talk to the people sitting on either side, or it can be used for slightly larger groups of three or four with everyone's shoulders "touching." (This also promotes the ability to speak softly).
Snowball Fight	Students respond to a prompt by writing an answer on a half sheet of paper. The student crumples the paper up like a snowball and tosses it across the room. Students pick up a snowball that lands close to them, add their own comment or answer, and crumple to toss again. Repeat as needed. The strategy encourages students to interact with the ideas of students who do not sit nearby in an anonymous manner.
Stand Up If	Teacher reads a statement and asks students to answer by standing up or staying seating. This can be used as a quick check for understanding (“stand up if you think the answer is…”), a way for students to quietly express an opinion, or a way of collecting classroom data for graphing (such as “stand up if you have a brother/like oranges/have a birthday in May,” and so on).
Talking Sticks	Students sit in a small group. Teacher gives one student a talking stick (this can be anything–a pencil, actual stick, a straw, and so on). Only the student with the stick may speak. The student can then pass the stick to another person. This strategy ensures that everyone has a turn speaking and that students don't interrupt each other.
T-chart	Students learn to organize information in this strategy. A T-Chart is a graphic organizer with two columns and a title (forming a T). Students can use a T-Chart to compare two ideas, sort facts and opinions, identify pros and cons, or brainstorm advantages and disadvantages. The format helps students to visually distinguish between the two columns of information.
Think, Pair, Share	Students think about a topic quietly to themselves, share ideas with one partner, then share out to the rest of the class. This strategy provides time for students who prefer to process ideas on their own before hearing other students share answers aloud.
Think Aloud	The teacher models a process of thinking by speaking aloud what is thought. As an example, "I think I need more color here in my drawing." This strategy models for students the type of thinking and decision-making they can use in an upcoming learning experience.
Think Time	The teacher allows a distinct period of silence so that students can process tasks, feelings, and responses. Allow students 15 to 30 seconds to think to themselves before calling on anyone to provide an answer to the class. This strategy is particularly helpful for shy or quiet students, as well as students who prefer to process content individually before contributing to a classroom or group conversation.
Thumbs Up	The teacher can quickly check for understanding using this strategy. Students hold thumbs up for agreement and thumbs down for disagreement to a question asked by the teacher. Thumbs Up can also be used as a way for students to signal to a teacher that they are ready for an instruction.
Turn and Talk	Students turn "knee to knee" and "eye to eye" with a Shoulder Partner to discuss answers to long-form questions. This strategy allows students to discuss ideas, reflect on learning, and check each other's answers.
Venn Diagram	Teacher draws two or more large overlapping circles as a graphic organizer to show what is the same and different about multiple topics. Teacher notes similarities in the overlapping section of the circles, then summarize differences in the respective parts of the circles that do not overlap. This strategy allows students to visually see and record similarities and differences.

INSTRUCTIONAL STRATEGY NAME	BRIEF DESCRIPTION
Wait Time	Similar to the Think Time strategy, the teacher waits at least seven seconds after asking a question to the whole class or after calling on a student to respond. This provides time for students to think independently before an answer is given out loud.
Web	A graphic organizer that illustrates relationships between facts, concepts, or ideas. A web is typically organized with a main idea written in a center circle, then related ideas or questions recorded in outer circles with lines connecting them back to the center. For young students one level of outer circles is usually enough, however more lines and circles can be added in a second level from the original outer circles if needed. This strategy allows students to visually see connections between ideas, and is often used to elicit prior knowledge about a topic.
Whisper	The teacher can provide whole class verbal processing time by allowing students to respond to a question by whispering the answer into their hands. This strategy prompts every student to attempt an answer, with no social-emotional recourse if their answer is wrong.
Zoo Can	Similar to Calling Sticks, the teacher pulls a name stick from the can and the students must count backward while acting like an animal. This can be used for relevant content instruction or as a quick break when students need to move and laugh before finishing a task or moving on to a new task.

Formative Assessment

What is formative assessment?

The term assessment often brings to mind exams. Exams can be effective at summarizing learning at the end of a chapter, unit, instructional period, or school year. After a student learns material for a certain amount of time, an exam measures how much the student has learned, retained, and can apply. **Formative assessment** encompasses strategies used in the classroom to find out if and how much students are learning along the way, so that instruction can be adjusted.

Why embed formative assessment in instruction?

Formative assessment is a tool that supports responsive teaching. Embedding formative assessment provides instructors with evidence about how much students are learning, retaining, and applying. A teacher who frequently seeks and receives feedback about how much progress students are making toward learning goals can adjust instruction to respond to misconceptions, misunderstandings, and gaps in students' ability to apply learning.

How does embedding formative assessment improve learning?

The following table (Wiliam, 2011) provides an overview of five strategies that instructors, peers, and students can use to give and receive evidence of learning throughout the learning process.

<table>
<tr><th></th><th>WHERE THE LEARNING IS GOING</th><th>WHERE THE LEARNER IS RIGHT NOW</th><th>HOW TO GET THERE</th></tr>
<tr><td>TEACHER</td><td rowspan="3">Clarifying, sharing, and understanding what we intend for students to learn and the criteria for success</td><td>Eliciting evidence of learning</td><td>Providing feedback that moves learning forward</td></tr>
<tr><td>PEERS</td><td colspan="2">Activating learners as instructional resources for one another</td></tr>
<tr><td>LEARNER</td><td colspan="2">Activating learners as owners of their own learning</td></tr>
</table>

Wiliam, Dylan. Embedded Formative Assessment. Bloomington: Solution Tree Press, 2011.

The first essential step is to identify (and share with students) the desired learning outcomes, or "where the learning is going." Once learning goals are established, teachers, peers, and students themselves can check in on "where the learner is right now," or how much progress is being made toward the goals. Rather than assessing whether or not a student has sufficiently learned content after the fact, formative assessment practices provide feedback so that teaching and learning ("how to get there") can be adjusted to better obtain the agreed-upon goals.

What does embedding formative assessment look like in the classroom?

Formative assessment often occurs through classroom discussions and tasks that ask students to explain and justify their thinking. If individual students struggle to understand or apply a concept, a teacher can differentiate instruction or provide peer support to meet that students' needs. Instructors can also gather information about student learning during instruction. For example, by walking around the classroom and checking students' work as they practice new learning on Apply pages in their Mathematics Student Book, teachers can learn a great deal very quickly about students' understanding and misconceptions. When many students exhibit evidence of misunderstanding or gaps in knowledge or skills, a teacher can decide to review, reteach, or present a new approach to achieving the learning goals.

Computational Thinking

What is computational thinking?

At its core, computational thinking is a way of solving problems. When we break down problems in a way that considers how computer power could help solve them, we are thinking computationally. It is the basis for developing computer programs and applications, but it is also helpful for solving problems in any context or field. Computational thinking is introduced to students in Primary 2 through five related skills.

What skills are involved?

Decomposition

- Decomposition is the process of breaking down a complex problem into smaller, more manageable parts.
- Young students are introduced to this skill by learning to break down numbers into their place value components, then move on to breaking down simple problems such as identifying the steps needed to solve a story problem. Students think about what they know and what they are trying to find out, and determine a process for solving the problem.

Pattern Recognition

- Pattern recognition involves observing and identifying patterns and trends in experiments, information, and data.
- Young students begin by observing patterns in numbers and shapes and by looking for similar patterns in the world around them.

Abstraction

- Once patterns have been recognized, abstraction involves identifying the broad or more general principles that explain and generate the patterns.
- Young students can identify repeated sequences or patterns in data, instructions, or computation, and can consider how to more efficiently express the pattern. This is often referred to as a "loop." Specifically in mathematics, this skill will help students make the cognitive leap from simple concepts to more complex ones. For example, in Primary 2, students begin to apply their understanding of number patterns (odd and even numbers, arrays, skip counting, and so on) to new situations. Students work with arrays to build an understanding of repeated addition, which they will later connect to a more efficient process—multiplication. Building these connections helps students deepen their understanding of mathematical concepts and the role of mathematics in their lives.

Algorithm Design

- Designing an algorithm begins with articulating step by step instructions for how to solve similar problems over and over again.
- Young students practice this skill in recognizing that the same steps can be taken to solve similar problems with different details. For example, to add numbers with more than one digit, students make connections between various experiences working with concrete materials (such as Base Ten manipulatives) to decompose and regroup the numbers and working out the same steps on paper.

Testing & Refining

- Testing and refining is essential to students increasing ownership of their own learning. The use of patterns, abstractions, and algorithms presents frequent opportunities to test and refine methods for accuracy and efficiency.
- Young students begin by identifying their own errors as the first step in this essential skill. Rather than assigning a grade after one attempt to answer a set of mathematics questions, Primary 2 students are often asked to compare their answer to a set of correct answers (or to a partner), and to identify what errors were made if their answer is incorrect.

Why is computational thinking important?

Utilizing the power of computers is an essential part of solving the grand challenges our world faces, as well as many of the problems we face in our local communities both today and in the future. Our students need to learn computational thinking skills so that they can leverage the power of today's and tomorrow's computers in solving problems. Computational thinking skills will also give our students another way to approach solving problems, and will build confidence and creativity.

How is computational thinking integrated into Primary 2 instruction?

For Primary 2, computational thinking applications are embedded in some Calendar Math, Learn, or Reflect segments. Additional optional opportunities for extending and deepening learning experiences are highlighted. When a lesson presents an opportunity to introduce or practice a computational thinking skill, a *Note to the Teacher* suggests how to integrate or emphasize computational thinking skills. For example, after practicing adding numbers and identifying the answers as even or odd, the following teacher note suggests extending the learning experience to include and leverage pattern recognition:

TEACHER Do: Walk around and observe students as they work. Take note of students who need additional support in identifying whether a number is even or odd. When Learn time is almost over, use an **Attention Getting Signal** to bring the group back together.

Note to the Teacher: As an extention activity for students who finish early, have them create a 2- digit addend and a 1-digit addend. This will enable students who are ready for a challenge to investigate even and odd number patterns past single digits.

To extends thie Learning expericence using computational thinking, ask students to consider and discuss how they can use patterns they identify for even and odd numbers to make their quicker and more efficient

TEACHER SAY: **Good job.Retunr to your seats and then circle all the sums that are odd.**

Primary 2 Term 2 Mathematics Scope and Sequence

PRIMARY 2	CHAPTERS 1-3	CHAPTERS 4-6
A. COUNTING AND CARDINALITY		
Instruction of Counting and Cardinality is completed by the end of Primary 1.		
B. OPERATIONS AND ALGEBRAIC THINKING		
1. Represent and solve problems involving addition and subtraction.	**X**	**X**
a. Explain Commutative Property of Addition of numbers up to 1,000 (does not need to know the name of the property).	X	
b. Fluently add and subtract within 20 using mental strategies.	X	
c. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.	X	X
d. Solve addition and subtraction problems within 100 with one unknown in any position within the equation.	X	X
e. Recall all sums of two one-digit numbers.	X	X
2. Work with equal groups of objects to gain foundations for multiplication.		X
a. Determine whether the number of total objects in a group (up to 20) is even or odd.		X
b. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns.		X
c. Write an equation to express the total number of objects in an array as a sum of equal addends.		X
C. NUMBERS AND OPERATIONS IN BASE TEN		
1. Work with numbers to gain foundations for place value.	**X**	**X**
a. Understand that the three digits of a three-digit number represent values of hundreds, tens, and ones.	X	
b. Determine the place value and the value of digits in numbers.	X	
c. Count by 5s, 10s, and 100s within 1000.	X	
d. Completes numerical patterns (up to 5).	X	
e. Creates new numerical patterns on his/her own.	X	
f. Read and write numbers to 1000 using numerals and expanded form.	X	X
g. Read and write numbers 1-9 and multiples of 10 through 100 in word form (alone, without sentences/context).	X	
h. For numbers 11-19 and non-multiples of 10 through 99, identify the numeral from the word form (written by the teacher; alone, without sentences/context).	X	

PRIMARY 2	CHAPTERS 1-3	CHAPTERS 4-6
i. Use place value to compare two numbers up to 1,000	X	
j. Use the symbols >, =, and < to express comparisons.	X	
k. Order a set of up to 5 numbers with values up to 1,000 from least to greatest or greatest to least.	X	
2. Use place value understanding and properties of operations to add and subtract multi-digit numbers.	X	X
a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.	X	X
b. Fluently add and subtract two 2-digit numbers with or without regrouping.	X	X
c. Add up to four 2-digit numbers with regrouping.		X
d. Add and subtract 1-, 2- and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.		X
e. Explain why it is sometimes necessary to regroup tens or hundreds to solve problems.		X
f. Use estimation strategies in problem solving, such as mentally adding and subtracting 10 or 100 (within 1000).		X
g. Explain why addition and subtraction strategies work, using place value and the properties of operations.	X	X
D. MEASUREMENT AND DATA		
1. Measure and estimate length and mass in metric units.		**X**
a. Measure lengths of objects in centimeters or meters. 1. Estimate lengths using centimeters and meters to benchmark lengths. (For example, about 1, 10, 50, 100 centimeters.) 2. Measure to determine how much longer or shorter one object is than another, expressing the difference in centimeters or meters. 3. Explain the relationship between centimeters and meters.		X
b. Measure masses of objects in kilograms. 1. Estimate mass using kilograms to benchmark lengths. (For example, about ½, 1, 5, or 10 kilograms.) 2. Measure to determine how much heavier or lighter one object is than another, expressing the difference in kilograms.		X
2. Solve problems involving measurement and estimation of length and mass.		**X**
a. Solve one-step word problems involving addition or subtraction of length or mass.		X
3. Work with time and money.	**X**	**X**
a. Tell and write time from analog and digital clocks to the hour, half-hour, and quarter-hour using a.m. and p.m.		X
b. Explain that a day equals 24 hours.		X
c. Distinguish between and use Gregorian and Hijri calendars.	X	X
d. Solve one-step word problems involving money.		X
e. Combine 1, 5, 10, 20, 50, and 100 Egyptian pounds in different ways to equal a given total within 1000.		X

PRIMARY 2	**CHAPTERS 1-3**	**CHAPTERS 4-6**
f. Describe the relationship between two denominations of money, including 1, 5, 10, 20, 50, and 100 pounds within 1000. (For example, it takes ten 10-pound notes to make 100 pounds.)		X
4. Represent and interpret data.	**X**	**X**
a. Organize data with up to four categories into scaled bar and pictographs (scales limited to 2, 5, 10).	X	X
b. Solve simple put-together, take-apart, and compare problems using data presented in a bar graph or pictograph.	X	X
E. GEOMETRY		
1. Identify and describe shapes; reason with shapes and their attributes.	**X**	**X**
a. Identify the attributes of two-dimensional shapes: triangles, quadrilaterals, pentagons, hexagons.	X	
b. Identify the attributes of three-dimensional shapes: square-based pyramids, cones, cylinders, spheres, cubes, and rectangular prisms (cuboids).	X	
c. Identify and draw shapes having specified attributes, such as a given number of corners (vertices) or sides.	X	
d. Partition circles and rectangles into two, three, or four equal parts.		X
e. Explain that each part is part of a whole or a set of objects.		X
f. Describe equal parts of a whole or set using words such as halves, thirds, half of, a third of, and so on, and describe the whole as two halves, three thirds, four fourths.		X

Lesson Preparation Template for Education 2.0

Grade (P2)Class: ______ Date: ______ Present: ______ Absent: ______ Students' total number: ______

Content / Windows	Theme	Chapter	Lesson	Learning Objectives	Activities	Teacher's Choices						
						Teacher guide Pages	Teaching strategies	Questions/ Modeling	Digital esources	Differentiation / Challenges	Maths Journal	Enrichment

Teacher's Self Reflection ☐ Exceeds expectations ☐ Meets expectations ☐ Sometimes Meets Expectations ☐ Below Expectations ☐

Grade (P2)Class: ______ Date: ______ Present: ______ Absent: ______ Students' total number: ______

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Teacher's Self Reflection ☐ Exceeds expectations ☐ Meets expectations ☐ Sometimes Meets Expectations ☐ Below Expectations ☐

PRIMARY 2

Mathematics

HOW THE WORLD WORKS

Chapter 1

Lessons 61 to 70

Lessons 61 to 70

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 61 to 70, students will work toward the following learning indicators:

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.d. Add and subtract 1-, 2-, and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.
2.e. Explain why it is sometimes necessary to regroup tens or hundreds to solve problems.
2.f. Use estimation strategies in problem-solving, such as mentally adding and subtracting 10 or 100 (within 1,000).
2.g. Explain why addition and subtraction strategies work, using place value and the properties of operations.

D. MEASUREMENT AND DATA:

3.d. Solve one-step word problems involving money.
3.e. Combine 1, 5, 10, 20, 50, and 100 Egyptian pounds in different ways to equal a given total within 1,000.
3.f. Describe the relationship between two denominations of money, including 1, 5, 10, 20, 50, and 100 pounds within 1,000.

Computational Thinking

Throughout Lessons 61 to 70, students will work toward the following learning indicators:

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.b. Fluently add and subtract two 2-digit numbers with or without regrouping.
2.d. Add and subtract 1-, 2- and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.
2.f. Use estimation strategies in problem-solving, such as mentally adding and subtracting 10 or 100 (within 1,000).
2.g. Explain why addition and subtraction strategies work, using place value and the properties of operations.

CH 1 Pacing Guide

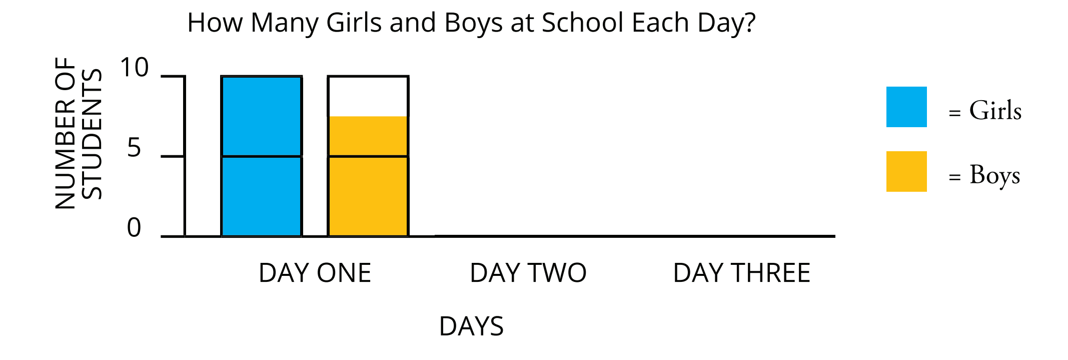
LESSON	INSTRUCTIONAL FOCUS
61	Students will: • Participate in Calendar Math activities. • Compare Egyptian banknotes (1, 5, 10, 20, 50, 100, and 200 LE). • Estimate monetary value of various items.
62	Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Discuss different ways to combine banknotes to create a given total.
63	Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Decompose large denominations of money into smaller denominations.
64	Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Identify different ways to combine banknotes to create a given total.
65	Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Identify different ways to combine banknotes to create a given total. • Add 2-digit and 3-digit numbers without regrouping.
66	Students will: • Participate in Calendar Math activities. • Solve one-step story problems involving money. • Add and subtract 2- and 3-digit numbers without regrouping.
67	Students will: • Participate in Calendar Math activities. • Apply place value concepts to add and subtract money. • Describe their real-world experiences with money.
68	Students will: • Participate in Calendar Math activities. • Apply place value concepts to add money with regrouping. • Add 2- and 3-digit numbers with regrouping.
69	Students will: • Participate in Calendar Math activities. • Apply place value concepts to subtract money with regrouping. • Subtract 2- and 3-digit numbers with regrouping.

LESSON	INSTRUCTIONAL FOCUS
70	Students will: • Participate in Calendar Math activities. • Apply place value concepts to solve story problems involving money. • Add and subtract 2- and 3-digit numbers with regrouping.

Chapter Preparation for Teacher

For Lesson 61:

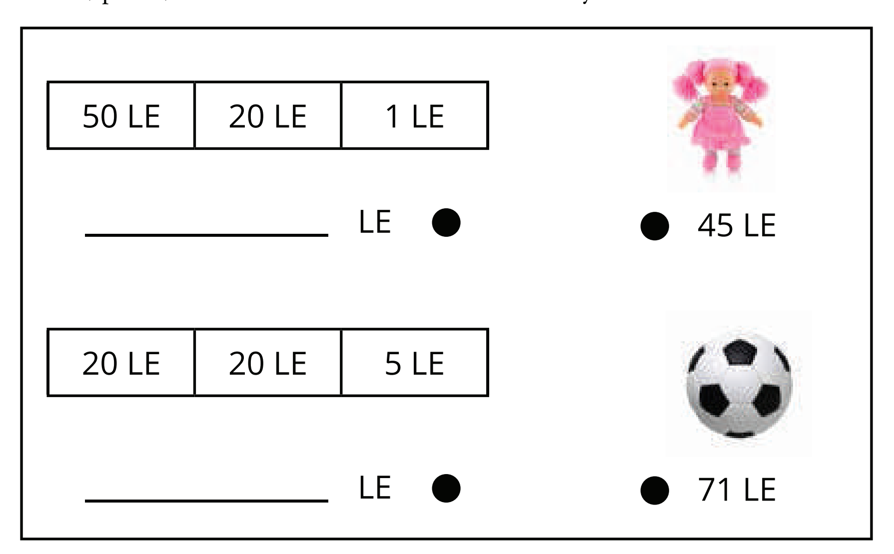
- Create a class bar graph: How Many Girls and Boys at School Each Day? This graph will be used in Lessons 61 through 65.
  - Use a scale of 1, 2, or 5 depending on the size of your class.
  - Make sure the bars for Girls and Boys are different colors. Sample graph shown below.



- Gather 1, 5, 10, 20, 50, and 100 LE banknotes to show students. Alternatively, print a set of large banknotes to use at the board. See the Large Banknotes Blackline Master.
- Print one copy of the Banknotes Blackline Master for each student. Students will cut out the banknotes and use them throughout the next two weeks.
  - Have students keep their banknotes in a bag or clip them together after math each day.
- Gather various items for students to estimate their cost. For example, paper clip (1 LE), eraser (5 LE), stapler (10 LE), small toy (20 LE), doll (50 LE), and board game (100 LE). You may choose to show pictures of some of these items, rather than the items themselves.

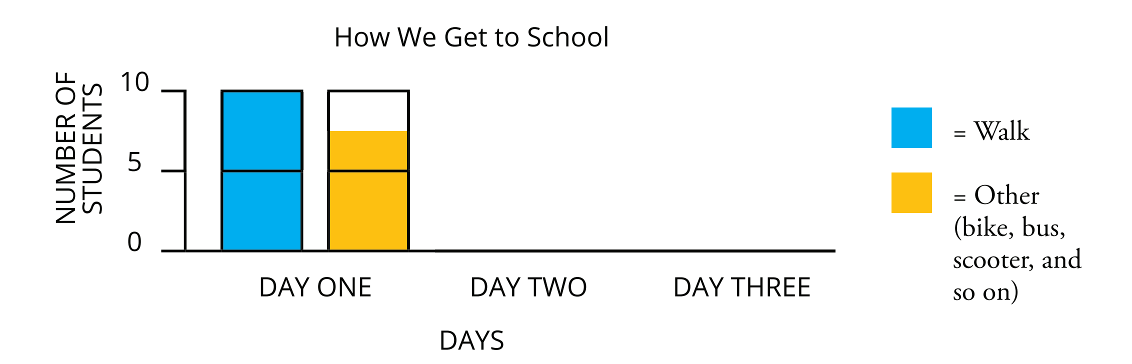
For Lesson 64:

- Draw the picture shown below on large poster paper or on the board. The picture should show items, prices, and different denominations of money.



For Lesson 66:

- Make a new class bar graph: How We Get to School. It will be used in Lessons 66 through 70.
  - Use a scale of 1, 2, or 5 depending on the size of your class.
  - Make sure the bars for Walk and Other are different colors. Sample graph shown below.



For Lessons 67 through 70:

- Make a large version of the place value/money mat that is in the Mathematics Student Book.

Place Value/Money Mat		
Hundreds 100 LE	Tens 10 LE	Ones 1 LE

- Use the large 1,10, and 100 LE notes from your set of banknotes for these lessons. Print more, if necessary, so you have 10 of each. See the Large Banknotes Blackline Master.

For Lesson 70:

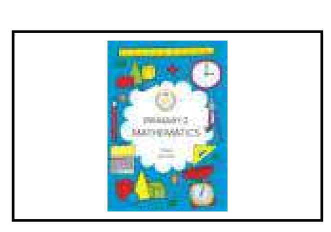
- Prepare a list of student groups in advance to ensure that there is at least one strong reader in each group and to facilitate the transition to group work.
- Print out copies of the Money Story Problem Cards Blackline Master. You will need one copy for each small group of 4 or 5 students.

Materials Used

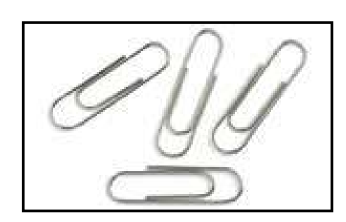
Calendar math area



Math student book



Paper clip



Eraser



Stapler



Small toy



Doll



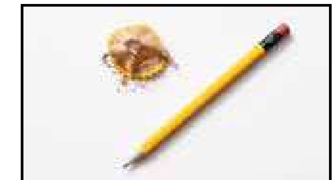
Board game



Banknotes



Pencil



Class graph

Poster of items, prices, money

Poster of place value/money mat

Money story problem cards

Lesson 61 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Compare Egyptian banknotes (1, 5, 10, 20, 50, 100, and 200 LE).
- Estimate monetary value of various items.

KEY VOCABULARY

- Banknote
- Currency
- Egyptian pound (LE)
- Estimate
- Money

MATERIALS

- Calendar Math area
- Poster of the class graph
- Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE)
- Student sets of banknotes (one set per student)
- Items or pictures of items for estimation
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Collect Egyptian banknotes to show students (1, 5, 10, 20, 50, and 100 LE). Alternatively, print a copy of the Large Banknotes Blackline Master.

Print one copy of the Banknotes Blackline Master for each student. Students will cut these out in this lesson and use them throughout the next two weeks. Have students keep their notes in a bag or clip them together after math each day.

Gather various items for students to estimate their cost. See Chapter Preparation for the Teacher for additional information.



Calendar Math (15 minutes)

Directions

Note to the Teacher: For Themes 3 and 4, Calendar Math will be slightly different, although the timing (approximately 15 minutes) will stay the same. Continue to discuss the day and month, number of school days, and place value practice. Then take the remaining time to review and practice previously taught skills with the class. This will give you an opportunity to assess which students may need additional instruction in those skills and which students may be ready for more challenging work.

For the first four lessons in this chapter, collect data about how many girls and how many boys are at school each day. The class will help you create a bar graph to show the data and compare it each day. On the fifth day of data collection (Lessons 65), students examine the graph and answer questions about the data. Data collection and analysis are important computational thinking skills. Students will apply those skills in a variety of learning and real-world contexts as they move through the primary, preparatory, and secondary grades. Encourage students to look for patterns and relationships between and among the data points.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Display blank graph. The graph should have a title and both axes should be labeled.

TEACHER SAY: **Today we will start collecting data about class attendance. We will collect data for four days and create a bar graph to show our data. On the fifth day, we will look at our graph and answer some questions about the data. Let's collect our data for today. We will count how many girls and boys are in school. Girls, please stand.**

 STUDENTS DO: Girls stand.

TEACHER DO: Count students in a variety of ways to model different approaches. Examples are listed below. Record the total on the board using numbers or tally marks.

- Count around the room one at a time, with students calling out each number.
- Count by 2s. Two students sit down at a time as teacher and students count 2, 4, 6, and so on.
- Student helper counts.

TEACHER SAY: **Girls, please sit. Stand if you are a boy.**

 STUDENTS DO: Girls sit. Boys stand.

TEACHER DO: Repeat the counting and recording process. Then guide students to compare the two quantities. Questions might include:

- How many more girls are here than boys today?
- How many fewer girls are here than boys today?
- How many total students are here today?

TEACHER DO: Use **Calling Sticks** to select a student to record the data on the bar graph for Day One.

 STUDENTS DO: Selected student adds two bars to the class graph.

TEACHER SAY: **In our next math lesson, we will add more data to our graph.**



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students review money by exploring the Egyptian pound and comparing banknotes. Students cut out copies of banknotes today and will use them throughout the next 10 lessons. This lesson describes the teacher holding up real banknotes for students to see. If banknotes are not available, use the copies in the Large Banknotes Blackline Master and adjust the language of the lesson.

1. TEACHER SAY: **I am going to the store after school today. I am going to buy some fruit. What do I need in order to buy my fruit? Raise your hand if you want to answer.**

 STUDENTS DO: Raise hand to answer. Selected students share their thinking.

TEACHER SAY: **Yes, I need money to purchase fruit. What other items can you buy with money? Turn and tell your Shoulder Partner three more things you can buy with money.**

 STUDENTS DO: Turn and tell a **Shoulder Partner** three things they need money for.

TEACHER DO: Select several students to share. Be sure services are mentioned as well as tangible items, such as haircuts, taxi rides, hotels, and so on.

TEACHER SAY: **In Primary 1 last year, you learned about the Egyptian pound, the CURRENCY—or money—we use here in Egypt. We often use LE to stand for the words "Egyptian pound." For example, if we have 5 pounds, we can write it as 5 LE.**

TEACHER DO: Write 5 LE on the board.

TEACHER SAY: **When you pay for something, you give the cashier banknotes to pay for your items. What is a BANKNOTE? What are the different kinds of banknotes? How are they alike and different? I want you to examine some of these banknotes. I have handouts for each of you. On the handouts you will see several copies of different banknotes. I am going to give you about 10 minutes to cut them out and examine them.**

TEACHER DO: Give one banknote handout to each student.

 **STUDENTS DO:** Cut out the banknotes and examine them.

TEACHER DO: As students are examining the notes independently, give them ideas of what to look for:

- Look at the pictures on the notes.
- What do you notice about the numbers?
- How are they the same? How are they different?
- Can you sort them into groups? How would you sort them?

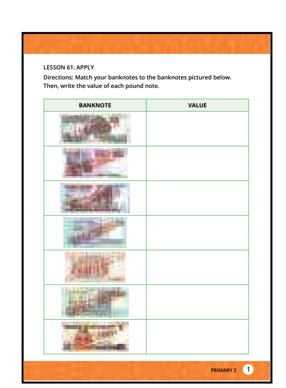
TEACHER SAY: **Put your money in one pile on your desk. The banknotes you have are copies and are not real. Real banknotes look different because they are in color and have a front and back. I want to show you what real banknotes look like. Let's investigate them now.**

TEACHER DO: Hold up the 1 LE banknote or colored picture. Walk around the classroom to show students.

TEACHER SAY: **This is the banknote that represents 1 LE, or 1 Egyptian pound. Hold up one of your 1 LE banknotes. You can see the number 1 on this banknote. That shows us it is worth 1 pound. What is something that may cost about 1 LE? Raise your hand to answer.**

 **STUDENTS DO:** Hold up 1 LE at desks. Examine the note. Raise hand to share an item that may cost about 1 LE.

TEACHER DO: Repeat with the other banknote denominations. Hold up each banknote or colored picture and walk around the classroom for students to see, examine, and name something that costs that much: 5 LE, 10 LE, 20 LE, 50 LE, and 100 LE.


LESSON 61: APPLY
Directions: Match your banknotes to the banknotes pictured below. Then, write the value of each pound note.

BANKNOTE	VALUE

PRIMARY 2

TEACHER SAY: **Let's explore these banknotes some more. Take out your Mathematics Student Book and turn to page Lesson 61: Apply.**

Note to the Teacher: Be aware that the table provided in the student book includes the 200 LE banknote, however when students are using banknotes as manipulatives, 100 LE is the largest denomination they will use.

 **STUDENTS DO:** Take out student books and turn to the correct page.

TEACHER SAY: **On this page you will see a picture of each of our banknotes on one side of the page. First, you will match one of your banknotes to its picture in your student book. You can put your banknote right on top of the picture. Next to each banknote, you will see a blank. You will write the value of each banknote in the blank next to its picture. Remember to look for the numbers on the banknote to help you. And remember to write LE after each number. This tells us the number is money.**

 **STUDENTS DO:** Match banknotes to the pictures of banknotes in student books. Write the value next to each banknote.

TEACHER DO: Walk around to observe students as they work. Answer questions and provide assistance, as needed. After about 5 minutes, use an **Attention Getting Signal**.

TEACHER SAY: **Let's play an estimation game. Remember, when we estimate, we use all of our knowledge to make our best guess. We will estimate the cost of some items. When I hold up an item, I want you to hold up the pound note you might use to pay for that item. Let's try the first one.**

TEACHER DO: Hold up the paper clip.



STUDENTS DO: Hold up the pound note that they estimate is the cost of the paper clip.

TEACHER SAY: Correct. You should be holding up the 1 LE banknote. One paper clip costs about 1 LE. Let's try another one.

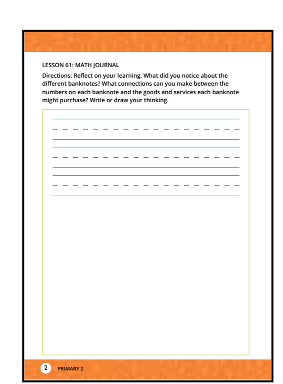
TEACHER DO: Continue with the other items in this order: eraser (5 LE), stapler (10 LE), small toy (20 LE), baby doll (50 LE), and board game (100 LE).



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on what they learned today about money, the Egyptian pound, and their set of banknotes. They are guided to make connections to the numbers on the banknotes and the goods and services they could purchase with them. The goal is to make the connection that the notes with the larger numbers may be used to purchase more items or more expensive items.



LESSON 61: MATH JOURNAL

Directions: Reflect on your learning. What did you notice about the different banknotes? What connections can you make between the numbers on each banknote and the goods and services each banknote might purchase? Write or draw your thinking.

2 PRIMARY 2

1. TEACHER SAY: Turn to page Lesson 61: Math Journal in your student book.



STUDENTS DO: Turn to page Lesson 61: Math Journal in their student book.

TEACHER SAY: Today we learned about the banknotes we use and how many Egyptian pounds each one represents. What did you notice about the different notes? What connections can you make between the number on the notes and the goods and services that each note could purchase? Write your reflection in your book.



STUDENTS DO: Write or draw their thinking in their book.

TEACHER DO: As students work, walk around and review some of their journal entries. Take note of students who may need additional instruction or support. The student book provides valuable formative assessment data.

TEACHER SAY: We will use our banknotes again in our next math lesson. Let's put them all in one pile. I am going to give you a _____ (bag, paper clip, envelope) to keep your notes together.



STUDENTS DO: Gather banknotes and put them together.

TEACHER DO: Have students store their banknotes or collect them for storage.

Lesson 62 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total.
- Discuss different ways to combine banknotes to create a given total.

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.

KEY VOCABULARY

- Banknote
- Currency
- Decompose
- Egyptian pound (LE)
- Equal sets
- Money

MATERIALS

- Calendar Math area
- Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE)
- Student sets of banknotes (one set per student)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Collect data for class graph How Many Girls and Boys at School Each Day? as done in Lesson 61.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students explore different ways to create sets of money with equal values using their 1, 5, 10, 20, 50, and 100 LE banknotes. They discover that they can combine small notes to create amounts equal to larger notes. This is a decomposing strategy and an important real-world application they will use when purchasing items.

To extend this learning experience using computational thinking skills, ask students to identify any patterns they observe as they work with money. Also, consider setting up a math center where students can practice

composing and decomposing banknotes to find different ways to create given totals. Students should record and post their work in the center and be encouraged to share and compare their thinking with others.

1. TEACHER SAY: **Yesterday we examined banknotes and talked about currency, or money. Turn and tell your Shoulder Partner one thing you learned yesterday about money.**

STUDENTS DO: Tell their **Shoulder Partner** one thing they learned about money.

TEACHER DO: Select two or three pairs to share their thoughts as a review.



STUDENTS DO: Selected students share their thoughts with the class.

2. TEACHER SAY: **Do you remember yesterday I said I was going to the store to purchase some fruit? Well, when I got to the store, the fruit cost 5 LE all together. My problem was, I did not have a 5 LE banknote. I had six 1 LE notes and one 10 LE note, but no 5 LE notes. So how could I pay for my fruit? I am going to give you some Think Time to find a strategy to solve my problem. Share your thinking with your Shoulder Partner. When you are ready, raise your hand.**



STUDENTS DO: Use **Think Time** to think of a strategy for solving the problem. Share thinking with their **Shoulder Partner**. Raise hand when they are ready.

TEACHER DO: Allow students time to think. Wait for most hands to be raised and then select a few students to answer.



STUDENTS DO: Selected students share their ideas.

TEACHER DO: Confirm appropriate strategies. Correct students' major misconceptions. Since they are just learning about money, it is not necessary to correct all misconceptions, just those that could limit their learning later.

TEACHER SAY: **I heard some of you say we can add different banknotes together to come up with 5 LE. When we have a larger number, we can decompose it into a set of smaller numbers. Let's look at my problem.**

Note to the Teacher: Students may also say, "use a larger banknote and get change." This is another important (and accurate) decomposition strategy.

TEACHER DO: Hand out or have students take out the sets of banknotes. Draw one 5 LE note on the board:



TEACHER SAY: **My fruit cost 5 LE. Using your banknotes, find a way to make 5 LE without using the 5 LE note. When you have found a way, I want you to pop up.**



STUDENTS DO: Use banknotes to find a way to make 5 LE without using the 5 LE banknote. Pop up when they have found an answer.

TEACHER DO: Have students sit. Use **Calling Sticks** to select a student to share an answer.



STUDENTS DO: Selected student shares their answer.

TEACHER SAY: **Yes, I could have used five 1 LE notes to pay for my fruit because five 1 LE notes is equal to one 5 LE note.**

TEACHER DO: On the board next to your drawing of the 5 LE note, write an = sign and then draw five 1 LE banknotes. See the example below.

5 LE	=	1 LE	1 LE	1 LE	1 LE	1 LE

TEACHER SAY: **Great work, class. Let's try another one.**

TEACHER DO: Draw one 10 LE note on the board.

10 LE

TEACHER SAY: **Use your banknotes to create 10 LE without using the 10 LE note. Pop up when you have an answer.**

 **STUDENTS DO:** Use banknotes to find a way to make 10 LE without using the 10 LE note. Pop up when they have found an answer.

TEACHER DO: Use **Calling Sticks** to select a student to share an answer.

 **STUDENTS DO:** Selected student shares an answer.

TEACHER DO: Draw the student's answer on the board (if it is correct). If it is not correct, ask the student to identify their error. Allow the student to ask friends for help. Once you have one correct answer on the board, move on.

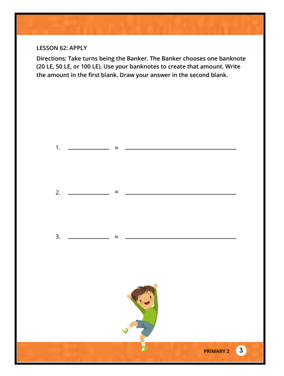
TEACHER SAY: **Raise your hand if you came up with a different way to make 10 LE using your banknotes.**

 **STUDENTS DO:** Raise hand to volunteer. Selected student shares a different answer.

TEACHER SAY: **That is right. There are two ways we can make 10 LE using the banknotes you have in your set.**

TEACHER DO: Draw the second method on the board (both methods shown below). Remember, students only have five 1 LE notes, so they are unable to make a set of ten 1 LE notes.

10 LE	=	5 LE	5 LE				
10 LE	=	5 LE	1 LE	1 LE	1 LE	1 LE	1 LE


LESSON 62: APPLY

Directions: Take turns being the Banker. The Banker chooses one banknote (20 LE, 50 LE, or 100 LE). Use your banknotes to create that amount. Write the amount in the first blank. Draw your answer in the second blank.

1. ______ = ____________
2. ______ = ____________
3. ______ = ____________

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3. TEACHER SAY: **Take out your Mathematics Student Book and turn to page Lesson 62: Apply.**

 **STUDENTS DO:** Take out book and turn to page Lesson 62: Apply.

TEACHER SAY: **You are going to play a game to practice making some other amounts of money. The game is called The Banker.**

I will put you in groups of three. You will take turns so that each of you will be the Banker one time. The Banker will choose one amount: 20 LE, 50 LE, or 100 LE. The other two students will find a way to create that amount using their banknotes. You may combine your sets of banknotes to solve the problem. Once you find a way to make the amount of money given by the Banker, draw it in your student book, just as I did on the board.

TEACHER DO: Help students form groups of three using **Count Off**.

 **STUDENTS DO: Count Off** to form small groups.

TEACHER SAY: **Find a place to sit and work together. You need your student book, your set of banknotes, and your pencil. Once you are seated together, begin playing the game.**

 **STUDENTS DO:** Find a spot to sit with their group. Take student book and banknotes. Play The Banker in groups and draw answers in their book.

Note to the Teacher: If students finish early, challenge them to find another way to make the 20, 50, and 100 LE quantities.

TEACHER DO: Walk around the room, observing students as they work and offering help as needed. Take note of students who may be struggling with identifying banknotes or counting money. After about 10 minutes, use an **Attention Getting Signal**.

TEACHER SAY: **If you combined your banknotes, separate them into individual sets again. Keep your student book open but go back to your seat with your book and your banknotes.**

 **STUDENTS DO:** Return to desk with student book and banknotes.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students found multiple ways to create 5, 10, 20, 50, and 100 LE amounts using their banknotes. Students reflect on their learning by comparing their combinations with their **Shoulder Partner's** *combinations. They examine how their combinations are alike and different and discuss whether there are any other ways to create the amounts.*

1. TEACHER SAY: **As we reflect today, I would like you to compare your banknote combinations with your Shoulder Partner's combinations. Compare the two sets for each amount. Are they the same? Are they different? Is there another way to make the amount? Discuss with your partner.**

 **STUDENTS DO:** Compare banknote combinations with their **Shoulder Partner**. Discuss alternate combinations for different amounts of money.

TEACHER SAY: **Great work today, class. You may put your book and set of banknotes away. We will use them again in our next math lesson.**

 **STUDENTS DO:** Put away student book and sets of banknotes.

Lesson 63 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total.
- Decompose large denominations of money into smaller denominations.

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.

KEY VOCABULARY

- Banknote
- Currency
- Decompose
- Denomination
- Egyptian pound (LE)
- Money

MATERIALS

- Calendar Math area
- Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE)
- Student sets of banknotes (one set per student)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Collect data for the class graph as done in Lesson 61.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students practice combining banknotes to create given totals. Students are given pictures of items with prices. They use their banknotes to create the amounts needed to pay for the items and draw their combinations in their Mathematics Student Book. This is a decomposition skill that is important for students to learn and use in the real world.

Decomposing larger problems into smaller problems is an important computational thinking skill. This learning activity allows students to practice decomposing in a small, manageable way so they can conceptualize the process and apply it to larger problems later.

1. TEACHER SAY: **Yesterday we learned that we can combine smaller banknotes to create the same amount as a larger banknote. Another word for the amount shown on a banknote is DENOMINATION. Your set of banknotes has several different denominations. Can you say denomination with me?**

 STUDENTS DO: Say: denomination.

TEACHER SAY: **We know another Primary 2 vocabulary word we can use that means to break up a bigger number into a set of smaller numbers. If you remember the word, whisper it to me on three. One, two, three.**

 STUDENTS DO: Whisper: decompose.

TEACHER SAY: **That is right, decompose. When we use money, it is important for us to be able to decompose, or break large amounts into smaller amounts. If an item costs 20 LE, you can still purchase the item even if you do not have a 20 LE note. To know what banknotes you will need, you can decompose the number 20. Talk with your Shoulder Partner about one way you could decompose 20 LE.**

 STUDENTS DO: Discuss with **Shoulder Partner** one way to decompose 20 LE.

2. TEACHER SAY: **You all did a great job. Unfortunately, when you buy items, they very rarely cost exactly 1, 5, 10, 20, 50, or 100 LE. Today we are going to practice finding a variety of ways to combine banknotes to create a given amount. Let's try one now.**

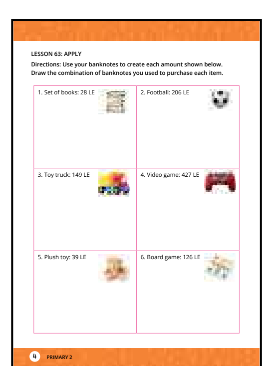
TEACHER DO: Draw a ball on the board with a price tag of 22 LE on it.

TEACHER SAY: **Use your banknotes to find a way to make 22 LE. If you do not need to use your banknotes to find an answer, that is okay too. When you have found a way, give me a Thumbs Up.**

 STUDENTS DO: Combine banknotes to make 22 LE. Give a **Thumbs Up** when they have an answer. Selected students share their answers.

TEACHER DO: Allow several students to share their answers. Although most students will create 22 LE using the banknotes they have, some students may identify other combinations, such as twenty-two 1 LE notes. Write students' answers on the board using the format shown below.

- 22 LE = 10 LE, 10 LE, 1 LE, 1 LE
- 22 LE = 10 LE, 5 LE, 5 LE, 1 LE, 1 LE
- 22 LE = 5 LE, 5 LE, 5 LE, 5 LE, 1 LE, 1 LE
- 22 LE = 20 LE, 1 LE, 1 LE


LESSON 63: APPLY

Directions: Use your banknotes to create each amount shown below. Draw the combination of banknotes you used to purchase each item.

1. Set of books: 28 LE	2. Football: 206 LE
3. Toy truck: 149 LE	4. Video game: 427 LE
5. Plush toy: 39 LE	6. Board game: 126 LE

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3. TEACHER SAY: **Great work. You came up with so many different ways to show 22 LE using our banknotes. Now it is time for you to practice on your own. Turn to page Lesson 63: Apply in the Mathematics Student Book.**

 STUDENTS DO: Turn to page Lesson 63: Apply in the student book.

TEACHER SAY: **In your book, you will see six different items with prices. Use your banknotes to make amounts equal to each price. Write the combination of notes you used just as I did on the board.**

TEACHER DO: Point to the board. Make sure students understand the directions.

 STUDENTS DO: Work independently to create amounts equal to the prices shown. Record the combination of banknotes they used.

TEACHER DO: Allow students time to finish. When they are done, use an **Attention Getting Signal**.

Note to the Teacher: As an extension activity for students who finish early, have them find another way to make each of the amounts.

TEACHER SAY: Share your work with your Shoulder Partner. Remember, you may have different combinations, and that is okay as long as your totals are the same. Check each other's work.

 **STUDENTS DO:** Trade student book with a **Shoulder Partner** and check each other's work.

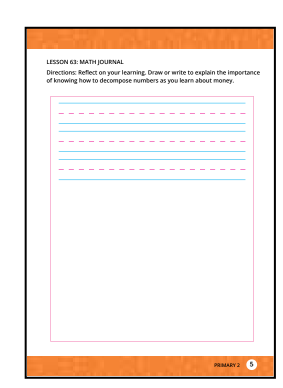
TEACHER DO: Allow students the remainder of the Learn segment to check their **Shoulder Partner's** work. Walk around and offer help as needed.



Reflect (5 minutes)

Directions

Note to the Teacher: In today's lesson, students practiced adding different denominations of banknotes together to create a given total. For Reflect, students reflect on their experience with decomposing amounts.



LESSON 63: MATH JOURNAL

Directions: Reflect on your learning. Draw or write to explain the importance of knowing how to decompose numbers as you learn about money.

PRIMARY 2 5

1. **TEACHER SAY: Turn to page Lesson 63: Math Journal in your student book.**

 **STUDENTS DO:** Turn to page Lesson 63: Math Journal.

TEACHER SAY: For Reflect today, write about or draw your ideas about decomposing numbers. Why is it important for us to know how to decompose larger numbers into smaller numbers as we learn about and use money? Use some Think Time and then write your reflection on your Math Journal page.

 **STUDENTS DO:** Use **Think Time** to reflect on decomposing. Write or draw their personal reflections.

TEACHER DO: Walk around and ask some students to explain their thinking to you. This is a great way to see if they understand the big picture. The Math Journal is a valuable source of formative assessment data.

TEACHER SAY: Wonderful job today, students. You may put away your book and banknotes.

STUDENTS DO: Put away student book and banknotes.

Lesson 64 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Identify different ways to combine banknotes to create a given total.	• Review vocabulary as needed.	• Calendar Math area • Poster of items, prices, and money • Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE) • Student sets of banknotes (one set per student) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Draw a poster showing items, prices, and denominations of currency. See Chapter Preparation for the Teacher for detailed instructions and an example.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Collect data for class graph as done in Lesson 61.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students build on the activity they completed in Lesson 63. They are given a set of Egyptian currency, determine the total, and then match the total to an item with the same price tag. This activity provides practice in computational thinking, particularly problem solving and decomposing, and builds students' automaticity in counting and combining currency.

1. TEACHER SAY: Talk to your Shoulder Partner about why it is important for us to learn how to count and add Egyptian pounds. Give me a Thumbs Up when you are ready to share your thinking.

 **STUDENTS DO:** Talk to **Shoulder Partner** about why it is important to learn how to count and add Egyptian pounds. Give a **Thumbs Up** when ready. Selected students share their thinking.

2. TEACHER SAY: Yesterday we looked at pictures of items with prices and used our banknotes to create that amount. Today you will count banknotes and then match the amount to the item with the same price tag. Let's do one together first.

TEACHER DO: Display the poster of items, prices, and denominations of money. Point to each part of the poster as you explain it.

TEACHER SAY: You can see we have two sides to the problem. On one side we see sets of pound notes and a blank for us to write the total. On the other side we see pictures of items with price tags. Next to each part we see black dots.

We need to connect the dots by matching each set of banknotes to the item with the price tag showing the same amount. How do you think we should begin? Give me a Thumbs Up if you have an idea.

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share their ideas.

TEACHER DO: Confirm accurate answers. Correct major misconceptions.

TEACHER SAY: Yes, first we need to find the total for each set of banknotes. Take out your money.

 **STUDENTS DO:** Take out set of banknotes.

TEACHER SAY: Use your banknotes to add 50 LE, 20 LE, and 1 LE. You may also use mental math strategies or the 120 Chart to add. For example, I can use the strategy of adding tens because I know that 50 is 5 Tens and 20 is 2 Tens. Raise your hand when you have found the total.

 **STUDENTS DO:** Add to find the total. Raise hand when finished. Selected students share their answers.

TEACHER DO: Write the correct answer on the poster.

TEACHER SAY: Great work. The total is 71 LE. 50 plus 2 Tens is 60, 70, and 1 more is 71. Now, add 20 LE, 20 LE, and 5 LE to find the next total. Use your banknotes, mental math strategies, or the 120 Chart.

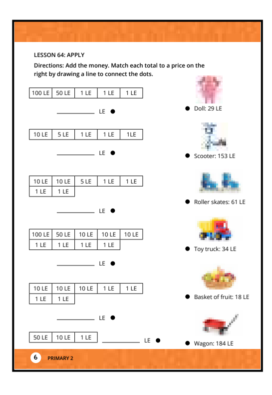
 **STUDENTS DO:** Selected students share their answers.

TEACHER DO: Write the correct answer on the poster.

TEACHER SAY: Wonderful. The total is 45 LE. 20 plus 2 Tens is 30, 40 and 5 more is 45. Now that we have the totals, we can draw lines to match them to the items.

TEACHER DO: Ask two students to draw lines to connect the matching dots.

 **STUDENTS DO:** Selected students draw lines to connect the matching dots.



LESSON 64: APPLY

Directions: Add the money. Match each total to a price on the right by drawing a line to connect the dots.

100 LE | 50 LE | 1 LE | 1 LE | 1 LE
_______ LE ●

10 LE | 5 LE | 1 LE | 1 LE | 1LE
_______ LE ●

10 LE | 10 LE | 5 LE | 1 LE | 1 LE | 1 LE | 1 LE
_______ LE ●

100 LE | 50 LE | 10 LE | 10 LE | 10 LE | 1 LE | 1 LE | 1 LE | 1 LE
_______ LE ●

10 LE | 10 LE | 10 LE | 1 LE | 1 LE | 1 LE | 1 LE
_______ LE ●

50 LE | 10 LE | 1 LE _______ LE ●

● Doll: 29 LE
● Scooter: 153 LE
● Roller skates: 61 LE
● Toy truck: 34 LE
● Basket of fruit: 18 LE
● Wagon: 184 LE

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3. TEACHER SAY: We matched each set of banknotes to the item that has the same price tag. It is time for you to try some on your own. Take out your Mathematics Student Book and turn to page Lesson 64: Apply.

 **STUDENTS DO:** Take out student books and turn to page Lesson 64: Apply.

TEACHER SAY: You will work on your own to complete this activity. Use your banknotes, mental math strategies, or the 120 Chart to help you add. Remember to write the total in your book and draw the line to match each total to the item that costs that amount.

 **STUDENTS DO:** Work independently to solve each problem.

TEACHER DO: As students work, circulate around the room, answering questions and offering support as needed. Take note of students who may need additional instruction or support. This activity provides valuable formative assessment data.

Note to the Teacher: As an extension activity, have students who finish early find different ways to create the totals shown on the price tags.

To extend students' application of computational thinking skills, provide the correct answers (without sharing the correct process) and have students review their own work to identify mistakes and determine how they made them. Students should correct their errors.

TEACHER DO: Go over each question with students, allowing them to identify and correct their errors. Call on students to share their answers.

 **STUDENTS DO:** Check and correct their work. Selected students share their answers with the class.

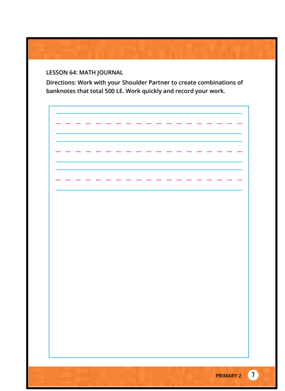
TEACHER SAY: Please keep out your student book.



Reflect (5 minutes)

Directions

Note to the Teacher: For today's Reflect segment, students work with a partner to find as many ways as they can to make 500 LE in just three minutes. This fun and engaging activity reviews the skills they practiced today but also challenges them by giving them a larger total to work with. Partners must work together because they have to share their sets of banknotes to create multiple ways of making 500 LE.


LESSON 64: MATH JOURNAL
Directions: Work with your Shoulder Partner to create combinations of banknotes that total 500 LE. Work quickly and record your work.

1. **TEACHER SAY: Turn to page Lesson 64: Math Journal in your student book.**

 **STUDENTS DO:** Turn to page Lesson 64: Math Journal.

TEACHER SAY: For Reflect today, you are going to have some fun with your Shoulder Partner. You will work together to see how many different ways you can create 500 LE using your banknotes. Record your combinations in your student book. You will have only three minutes. Ready? Go.

 **STUDENTS DO:** Collaborate with their **Shoulder Partner** to come up with as many ways as they can to create 500 LE using banknotes. Record their combinations on the Math Journal page.

TEACHER DO: After three minutes, ask students to stand if they have at least two combinations, stay standing if they have three combinations, and so on. Continue until there is only one group left. Have students clap for the students with the most combinations.

Lesson 65 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Combine 1, 5, 10, 20, 50, and 100 LE notes to create a given total. • Identify different ways to combine banknotes to create a given total. • Add 2-digit and 3-digit numbers without regrouping.	• Budget	• Calendar Math area • Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE) • Student sets of banknotes (one set per student) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

Note to the Teacher: For the last part of Calendar Math, students analyze the graph they created in Lessons 61 to 64.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the past four days, we have collected data about how many boys and girls were in school each day. Today we are going to look at the graph we made and answer some questions.

TEACHER DO: Ask students questions about the graph. Examples are listed below.

- Which day had more girls than boys?
- Which day had more boys than girls?
- Which day had the most boys/girls?
- Which day had the fewest boys/girls?
- Which day had the most students at school in total?
- Why do you think there were fewer students at school on day___?



STUDENTS DO: Analyze the class bar graph and answer questions about the data.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students apply what they have learned about Egyptian currency and adding banknotes. They experience a real-world challenge by "shopping" in a class "store." Each student is given a budget of 500 LE. Their challenge is to purchase as many items as they can without going over their budget. This activity will help you determine whether or not students understand the value of each denomination and can decompose and add money. It is NOT expected that students will have mastered keeping a running total of money. What is important is that they engage in the thinking processes and discussions required to complete the activity.

To extend this learning experience using computational thinking skills, set up a class "store" with actual items that students can practice purchasing. This activity allows students to model purchasing, adding, subtracting, and making change as they act out the role of shopper or seller. Using models to build understanding of complex concepts is an important computational thinking skill.

1. **TEACHER SAY: For the last several days, we have explored our country's currency and worked to find different ways to create given amounts. Today you will work with a partner to go pretend shopping in our class store. Raise your hand if you have ever been shopping.**

 **STUDENTS DO:** Raise hand if they have been shopping.

TEACHER SAY: Usually an adult pays for your items, right? But today, it will be up to you to manage your money as you pretend to buy different items. Please take out your Mathematics Student Book and turn to page Lesson 65: Apply.

 **STUDENTS DO:** Turn to page Lesson 65: Apply.

TEACHER SAY: At the top of the page in your student book, you see the virtual class store. There are several different items in the store with different prices. You and your Shoulder Partner will have 500 LE to spend at the store. 500 LE is your budget. A BUDGET is a spending limit, or a plan for how much you can spend. There is also a chart on the facing page. This is where you and your partner will record the items you want to purchase and the price of each item.

 **STUDENTS DO:** Look in their student book to find the virtual store and the chart where they will record their work.

TEACHER SAY: Your challenge is for you and your partner to buy as many items as possible with your 500 LE. This requires some critical thinking and careful planning. What will your strategy be to make sure you buy the most items with your money? How will you make sure you do not go over 500 pounds? Think for a moment. Give me a Thumbs Up when you have an idea.

 **STUDENTS DO:** Think quietly about the strategy they will use. Give a **Thumbs Up** when they are ready to share. Selected students share their ideas with the class.

TEACHER SAY: Wow, those are great strategies. Some of you may have other strategies that you would like to try. In this challenge, you must write down the items you want to purchase as well as their price. You must also keep track of how much money you spend. How can you do this? Raise your hand if you have a strategy in mind.

 **STUDENTS DO:** Raise hand to volunteer. Selected students share their strategies.

TEACHER SAY: Great ideas. When you decide to purchase items, it is a good strategy to record their prices and add them together right away. That way, you can make sure you do not go over your budget of 500 LE. Also, you will only be adding two numbers at a time. What can you do if you go over your budget? Think for a moment. Wave at me when you have an idea.

 **STUDENTS DO:** Think for a moment. Wave hand when they have an idea. Selected students share their thinking.

2. TEACHER SAY: Wonderful. You can change your mind about items. If you change your mind, you can erase the item and subtract its price from your total. You may use your banknotes to help you if you choose. You may also use mental math strategies and the 120 Chart, if helpful. Are you ready? Let's go shopping.



STUDENTS DO: Work with their **Shoulder Partner** to shop in the class store, buying as many items as possible with 500 LE. Record shopping lists and prices and calculate the total amount spent after each "purchase."

TEACHER DO: Walk around and offer help as needed. When students are finished (or near the end of the Learn segment), use an **Attention Getting Signal**.

3. TEACHER SAY: Wow. Shopping is hard work. Do you think we all have the same shopping lists? How can our shopping lists be different if we all have the same budget?

TEACHER DO: Use **Calling Sticks** to select students to share their thinking. Allow students to ask a friend for support.



STUDENTS DO: Selected students share their thinking, asking for support as needed.

TEACHER DO: Have some pairs share their shopping lists. If possible, try to identify the pair that purchased the most items.



STUDENTS DO: Selected pairs share the items they bought with their 500 LE.

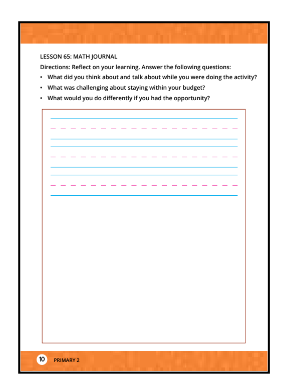
TEACHER SAY: Great work today. Please keep out your student book.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on the kinds of decisions they had to make today and the conversations they had about money. They identify what they would do differently if they were able to do the activity again.



LESSON 65: MATH JOURNAL

Directions: Reflect on your learning. Answer the following questions:

- What did you think about and talk about while you were doing the activity?
- What was challenging about staying within your budget?
- What would you do differently if you had the opportunity?

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1. TEACHER SAY: Turn to page Lesson 65: Math Journal in your student book.



STUDENTS DO: Turn to page Lesson 65: Math Journal.

TEACHER SAY: Today we saw what it was like to go shopping with a budget, or a set amount that we can spend and cannot go over. What were some of the challenges of staying within your budget and not spending more than 500 LE? What did you think about? What did you talk about? What would you do differently if you got to do the activity again? Write your thoughts on your Math Journal page.



STUDENTS DO: Reflect on the experience. Answer the questions in their student book.

TEACHER DO: As students work, walk around and read some of their journal entries. Be sure to read all entries at a later time. The math journal entries provide valuable formative assessment data about students' learning and can help you identify and address lingering misconceptions.

TEACHER SAY: Wonderful work today. You may put away your student book and banknotes for today.



STUDENTS DO: Put away their student book and banknotes.

Lesson 66 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Solve one-step story problems involving money.
- Add and subtract 2- and 3-digit numbers without regrouping.

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.

KEY VOCABULARY

- Review vocabulary as needed.

MATERIALS

- Calendar Math area
- Large set of Egyptian banknotes (1, 5, 10, 20, 50, and 100 LE)
- Student sets of banknotes (one set per student)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today students are introduced to a new graphing question. The procedure for collecting data, creating the graph, and discussing the data is the same as it was for Lessons 61 to 65.

1. TEACHER DO: Use **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: In our last five math lessons, we collected data about how many boys and girls were in school each day. We looked at our data and answered some questions about it each day.

Today we are going to do a similar activity but with a new question: How do we get to school, by walking or another way? The other way could be bike, car, bus, scooter—as long as it is not walking. We will collect data the same way we did for our last graph. Pop up if you walked to school today.



STUDENTS DO: Pop up if they walked to school.

TEACHER DO: Count students in a variety of ways. Record the total on the board using a number or tally marks.

TEACHER SAY: Now pop up if you came to school another way besides walking.



STUDENTS DO: Pop up if they did not walk to school.

TEACHER DO: Repeat the counting and recording process. Guide students to compare the two quantities. Questions might include:

- How many students walked to school today?
- How many students traveled to school another way?
- How many more/fewer students walked than traveled another way?

TEACHER DO: Use **Calling Sticks** to select a student to record the data on the bar graph for Day One.

 **STUDENTS DO:** Selected student adds two bars to the class graph.

TEACHER SAY: **In our next math lesson, we will add more data to our graph.**



Learn (40 minutes)

Directions

Note to the Teacher: Today, students solve one-step story problems involving money. This activity requires students to find the addition or subtraction problem in the story and solve accordingly. These problems do not require students to regroup.

1. TEACHER SAY: **You are becoming experts on Egyptian currency. Let's review a little bit about what we have learned by playing a game called Show What You Know. First, stand up and find a partner using Hands Up, Pair Up.**

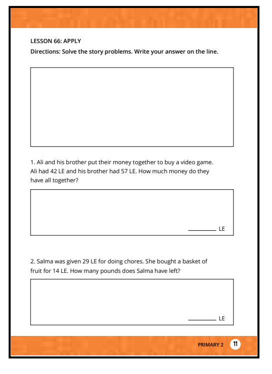
 **STUDENTS DO:** Find a partner using **Hands Up, Pair Up**.

TEACHER SAY: **I am going to ask a question. Talk to your partner about the answer. When you and your partner agree on an answer, wave your hands in the air. The first question is: What do we call our currency?**

 **STUDENTS DO:** Take turns sharing what they know with partners. Wave their hands when they agree on the answer. Selected partners share their answer with the class.

TEACHER DO: Continue the game with the questions below.

- What is the largest banknote we have used in class?
- What is the smallest banknote we have used in class?
- Why do we need to know how to add and subtract money?
- What questions do you still have about money? Talk to your partner.
    - Select a few students to share their questions. See if any students are able to answer their friends' questions.


LESSON 66: APPLY

Directions: Solve the story problems. Write your answer on the line.

1. Ali and his brother put their money together to buy a video game. Ali had 42 LE and his brother had 57 LE. How much money do they have all together?

______ LE

2. Salma was given 29 LE for doing chores. She bought a basket of fruit for 14 LE. How many pounds does Salma have left?

______ LE

PRIMARY 2 11



2. TEACHER SAY: **Great job reviewing. Please open your Mathematics Student Book to page Lesson 66: Apply.**

 **STUDENTS DO:** Open student books to Lesson 66: Apply.

TEACHER SAY: **Today we are going to use money in a different way. We are going to solve story problems using money. Remember, when we have a story problem, the first thing we have to do is figure out what question we are trying to answer. Then we have to figure out what information we have and whether we should add or subtract to find that answer. Let's try one together. Point to the empty box at the top of the page.**

 **STUDENTS DO:** Point to the empty box at the top of the page.

TEACHER SAY: **I am going to give you a story problem. Record your work in the empty box. When you are finished, compare your answer with your Shoulder Partner's. Give me a Thumbs Up when you are finished.**

TEACHER DO: Read the story problem aloud at least two times: My grandmother gave me 55 LE for my birthday. I bought a stuffed bear for 34 LE. How many pounds do I have left?

 **STUDENTS DO:** Solve the problem, compare answers with their **Shoulder Partner**, and give a **Thumbs Up** when finished.

TEACHER DO: Observe students as they work. Take note of students who do not choose the correct operations to solve the problems.

Note to the Teacher: To extend students' learning using computational thinking skills, adjust the procedure of this lesson as follows: Share the correct answer and ask students to identify and correct their errors. Identifying and fixing mistakes is an important computational thinking skill and students will benefit from the experience of reviewing and reflecting on their own work.

 **STUDENTS DO:** Selected students share their work and thinking with the class.

TEACHER DO: Write the problem on the board: 55 LE – 34 LE =

TEACHER SAY: Let's think about this problem another way—by using place value. Both of these numbers are 2-digit numbers with digits in the Tens and Ones places. When we subtract, we start with the Ones place. I see 5 Ones minus 4 Ones. What is 5 – 4? Show me on your fingers.

 **STUDENTS DO:** Show 1 on their fingers.

TEACHER SAY: In the Tens place, I see a 5 and a 3. What is 5 Tens minus 3 Tens? Show me on your fingers.

 **STUDENTS DO:** Show 2 on their fingers.

TEACHER DO: Add the answer to the equation on the board.

TEACHER SAY: Notice that I wrote LE after 21. Why is it important for us to always write LE after our answer when we are solving a problem with money?

 **STUDENTS DO:** Raise hand to answer. Selected students share their thinking.

3. TEACHER SAY: Correct. The problem asked how many pounds I have left. My answer is not 21. My answer is that I have 21 LE left. Are you ready to try some on your own? You will solve the story problems in your student book. Remember, you have to think about what the question is asking, then figure out whether you have to add or subtract. Pay close attention to the words in the story.

 **STUDENTS DO:** Work independently to solve each money story problem using addition or subtraction.

TEACHER DO: Circulate around the room, offering help to students who need it. Ask some students to explain their thinking and problem-solving strategies. Use this time to take note of which students are struggling with the math concepts. When students finish, go over the answers together or have students check their work with their **Shoulder Partner**s as time allows.

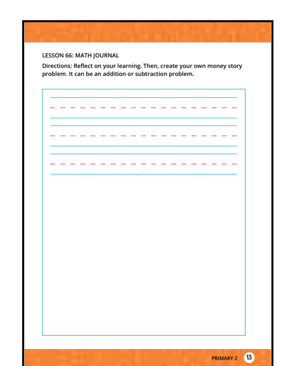
 **STUDENTS DO:** Check their answers, making corrections if necessary.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students applied previously learned addition and subtraction strategies to solve one-step story problems. Students reflect on the skills they practiced today and apply them to create their own money story problems.



1. TEACHER SAY: **Turn in your student book to page Lesson 66: Math Journal.**

 STUDENTS DO: Turn to page Lesson 66: Math Journal in their student book.

TEACHER SAY: **Today we added and subtracted numbers together to solve story problems involving money. For Reflect, you will create your own money story problem. You may decide whether to make it an addition or subtraction problem. Write your story problem on your Math Journal page.**

 STUDENTS DO: Write an original money story problem in the student book.

TEACHER DO: If time allows, have students swap books with their **Shoulder Partner**s to solve. At a later time, review students' story problems to see if they understand how to construct story problems involving addition or subtraction.

TEACHER SAY: **I am so proud of your hard work. You may put away your book for today.**

 STUDENTS DO: Put away their student book.

Lesson 67 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply place value concepts to add and subtract money. • Describe their real-world experiences with money.	• the value the digit	• Calendar Math area • Large set of Egyptian banknotes (1, 10, and 100 LE) • Student sets of banknotes (one set per student) • Mathematics Student Book and pencil • Poster of place value/ money mat

LESSON PREPARATION FOR THE TEACHER

Make a large version of the place value/money mat that is in the Mathematics Student Book.

Use the large 1,10, and 100 LE notes from your set of banknotes for these lessons. Print more, if necessary, so you have 10 of each. See the Large Banknotes Blackline Master.



Calendar Math (15 minutes)

Directions

1. **TEACHER DO:** Use **Calling Sticks** to select one student.



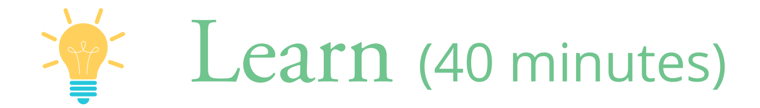
STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

2. **TEACHER DO:** Guide student helper through the procedure, including the following:
   - Current month
   - All months of the year
   - Current day
   - All days of the week
   - Today's date: Today is (day of week) the (date) of (month) (year).
   - Yesterday and tomorrow
   - Days in school (place value pockets, circle 120 Chart, count aloud)
     - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

TEACHER DO: Collect and record data for the class graph.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students connect place value concepts to the 1, 10, and 100 LE banknotes. The place value/money mat in their Mathematics Student Book helps them make and apply the connection.

In Theme 2, students used Base Ten manipulatives and pictures to explore place value and regrouping. In today's lesson, students begin to use money to do the same thing. Using money gives students another perspective into the act of regrouping, making the abstract more concrete.

Using models, including place value, to make sense of abstract concepts is an important computational thinking skill. To support and enhance students' learning, set up a math center where students can continue to practice using this model to create given amounts of money using 1 LE, 10 LE, and 100 LE notes and a place value mat.

1. TEACHER DO: Display the place value/money mat on the board.

Place Value/Money Mat		
Hundreds 100 LE	Tens 10 LE	Ones 1 LE

TEACHER SAY: You have worked with money for the past few days. You have combined money to make specific amounts. You have added money to spend within a budget. And yesterday, you solved addition and subtraction story problems involving money. Today we are going to continue to work with money but only with 1 LE, 10 LE, and 100 LE notes.

TEACHER DO: Show the class a large 1 LE, 10 LE, and 100 LE note.

TEACHER SAY: Turn to your Shoulder Partner and discuss how these three notes are alike and different. I will use Calling Sticks to choose some of you to share.



STUDENTS DO: Turn to their **Shoulder Partner** and talk about how the 1, 10, and 100 LE notes are alike and different. Selected students share their thinking.

TEACHER SAY: Good job. These three notes all have a 1, but the 10 has a 1 and a zero and the 100 has a 1 and two zeros. They have different values. Remember that, in money, VALUE means how much something is worth. A 10 LE note is worth more than 1 LE and a 100 LE note is worth more than a 10 LE note.

We have worked this year on decomposing numbers into Hundreds, Tens, and Ones, or their place value. The 1, 10, and 100 LE notes are like our place value system for numbers. We can use place value to help us understand and work with money.

2. TEACHER DO: Point to place value/money mat on the board.

TEACHER SAY: Let's look at this place value/money mat on the board. It is divided into three columns—Hundreds, Tens, and Ones. I have also added 100 LE, 10 LE, and 1 LE to each column.

Place Value/Money Mat		
Hundreds 100 LE	Tens 10 LE	Ones 1 LE

TEACHER SAY: I am going to use this place value/money mat to build some combinations of money. First, I am going to put three 10 LE notes in the Tens column.

TEACHER DO: Place three 10 LE notes in the Tens column.

TEACHER SAY: And four 1 LE notes in the Ones column.

TEACHER DO: Place four 1 LE notes in the ones column.

TEACHER SAY: Turn and Talk to your Shoulder Partner about the total amount of money shown on the mat. Use what you know about place value to help you. Give a Thumbs Up when you are ready to share.

 **STUDENTS DO:** **Turn and Talk** to **Shoulder Partner**. Give a **Thumbs Up** when they are ready to share. Selected students share their answers.

TEACHER SAY: Yes, 3 Tens is 30 and 4 Ones is 4, so we have 34 LE. Take out your Mathematics Student Book and turn to page Lesson 67: Apply.

 **STUDENTS DO:** Take out student books and turn to page Lesson 67: Apply.

3. TEACHER SAY: On this page, you will see a place value/money mat like mine. It is your turn to practice adding money using the mat. Take out your set of money. You will only need the 1, 10, and 100 LE notes.

 **STUDENTS DO:** Take out 1, 10, and 100 LE notes.

TEACHER SAY: Working with your Shoulder Partner, build 167 LE on one of your place value/money mats. In which column will you place the 100 LE notes? Call out if you know.

 **STUDENTS DO:** Call out: Hundreds.

TEACHER SAY: In which column will you place the 10 LE notes?

 **STUDENTS DO:** Call out: Tens.

TEACHER SAY: What notes will you place in the Ones column?

 **STUDENTS DO:** Call out: 1 pound notes.

TEACHER SAY: Begin working. Give me a Thumbs Up when finished.

STUDENTS DO: Build the number 167 with their **Shoulder Partner**. Give a **Thumbs Up** when finished.

TEACHER DO: Walk around and observe students as they work. Take note of students who may need additional instruction and support. When students are finished, select a pair of students to show their work at the board.



STUDENTS DO: Selected students show their work.

TEACHER DO: Repeat the procedure with numbers like 450 LE, 325 LE, 75 LE, 120 LE, 810 LE, 990 LE, and 580 LE. For each number, have student pairs show their work at the board and explain their thinking.



STUDENTS DO: Build numbers with their **Shoulder Partner**. Give a **Thumbs Up** when finished. Selected students show their work at the board and explain their thinking.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students connected place value concepts to money. In Reflect, students connect their learning to their real-world experiences with money.

1. **TEACHER SAY: We have been working on money for several days. Since we have been working with money, have you helped a friend or relative count or spend money? Have you taught someone younger than you about money? Talk to your Shoulder Partner about the experiences you have had with money outside of our classroom.**



STUDENTS DO: Talk to their **Shoulder Partner** about their real-world experiences with money.

TEACHER DO: After a few minutes, use **Calling Sticks** to select students to share their experiences.



STUDENTS DO: Selected students share their experiences with the class.

TEACHER SAY: Thank you for sharing your experiences with money. It is exciting to hear how you are connecting what you are learning in school to your lives outside of school. I look forward to hearing more about how you are applying your new learning. Put away your student book.



STUDENTS DO: Put away student book.

Lesson 68 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Apply place value concepts to add money with regrouping.
- Add 2- and 3-digit numbers with regrouping.

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.

KEY VOCABULARY

- Review vocabulary as needed.

MATERIALS

- Calendar Math area
- Poster of place value/ money mat
- Large set of Egyptian banknotes (1, 10, and 100 LE)
- Student sets of banknotes (one set per student)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

2. TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

3. TEACHER DO: Collect and record data for class graph.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students continue to connect their understanding of place value to the 1, 10, and 100 LE notes. This lesson focuses on adding with regrouping.

1. TEACHER DO: Display the place value/money mat on the board. Have your large banknotes nearby.

TEACHER SAY: **Yesterday we looked at how our 1, 10, and 100 LE notes are similar to Ones, Tens, and Hundreds in place value. How many Ones does it take to make a Ten? Call out if you know.**



STUDENTS DO: Call out: 10.

TEACHER SAY: **Good. And how many 1 LE notes do we need to make a 10 LE note?**



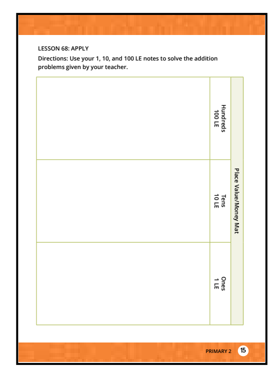
STUDENTS DO: Call out: 10.

TEACHER SAY: **Great. How many 10 LE notes do we need to make a 100 LE note? Lean and Whisper to your Shoulder Partner.**



STUDENTS DO: Call out: 10.

TEACHER SAY: **There seems to be a pattern. We looked at this pattern a couple of weeks ago when we were adding and had too many Ones in the Ones place. When that happened, we regrouped them to form a Ten. In the real world, we do not have to regroup our 1 LE notes if we have more than nine, but we could. We could trade ten 1 LE notes for one 10 LE note. Let's see how understanding these patterns can help us add money. Take out your Mathematics Student Book and turn to page Lesson 68: Apply.**



STUDENTS DO: Take out student books and turn to Lesson 68: Apply.

2. TEACHER SAY: **Today we are going to be adding and subtracting money. We will use what we know about place value and regrouping to help us. In your book, you see a place value/ money mat like the one we used in our last math lesson. Let's work together to solve some practice problems, then you can try some on your own. Take out your money. You and your Shoulder Partner will share.**



STUDENTS DO: Take out banknotes.

TEACHER SAY: **Let's solve a problem together. Work with your Shoulder Partner to put 560 LE on your mat.**



STUDENTS DO: Work with **Shoulder Partner** to put 560 LE on one mat.

TEACHER SAY: **Now, add another 350 LE to your mat.**



STUDENTS DO: Work with **Shoulder Partner** to add 350 LE to the mat.

TEACHER DO: Write 560 LE + 350 LE = _____ on the board.

TEACHER SAY: **We could just count the money to find the sum of 560 LE and 350 LE, but instead let's use what we know about place value and addition to find the sum. Where do we start when we are adding numbers?**



STUDENTS DO: Call out: Ones place.

TEACHER SAY: **Look at the banknotes in the Ones place. How many 1 LE notes are there?**



STUDENTS DO: Call out: none/zero.

TEACHER SAY: **Well, that was easy to add. We have zero Ones. Now count your 10 LE notes. Raise your hand when you know how many there are.**



STUDENTS DO: Count their 10 LE notes. Raise hand when they are finished. Selected students answer the question.

TEACHER SAY: **We have eleven 10 LE notes. Can we leave them all in the Tens column? Put your finger on your nose if you would like to share your thinking.**



STUDENTS DO: Put finger on nose to volunteer. Selected students share their thinking.

TEACHER DO: Confirm accurate responses. Correct misconceptions. If necessary, help students connect their thinking to what they know about place value.

TEACHER SAY: **We know that we can only have up to 9 Tens in the Tens place. We have 11. What should we do?**

TEACHER DO: Use Calling Sticks to select students to share their thinking. If students are unsure, prompt them to think about Calendar Math and the process they use when counting school days.

STUDENTS DO: Selected students explain how to resolve the issue of too many 10 LE notes in the Tens column.

TEACHER DO: Confirm correct responses. Correct misconceptions. If necessary, help students connect their thinking to what they know about place value.

TEACHER SAY: **We must regroup the 10 LE notes. How many 10 LE notes does it take to make a 100 LE note?**

STUDENTS DO: Call out: 10.

TEACHER SAY: **Wonderful. Make a group of ten 10 LE notes.**

STUDENTS DO: Make a group of 10 LE notes.

TEACHER DO: As students are working, model the process at the board.

TEACHER SAY: **Trade your ten 10 LE notes for one 100 LE note.**

STUDENTS DO: Trade their ten 10 LE notes for one 100 LE note.

TEACHER DO: As students are working, model the process at the board.

TEACHER SAY: **Where should we put the 100 LE note?**

STUDENTS DO: Call out: the Hundreds column.

TEACHER SAY: **Excellent. Put your new 100 LE note in the Hundreds column with your other 100 LE notes.**

STUDENTS DO: Place the 100 LE note in the Hundreds column.

TEACHER DO: As students are working, model the process at the board.

TEACHER SAY: **Now what is our last step for solving this addition problem?**

STUDENTS DO: Call out: add the 100 LE notes.

TEACHER SAY: **Do that now. Give me a Thumbs Up when you and your Shoulder Partner have the answer to 560 LE plus 350 LE.**

STUDENTS DO: Count the money to find the sum. Give a Thumbs Up when ready.

TEACHER DO: As students are working, model the process at the board. Call on students with Thumbs Up to give the answer.

TEACHER SAY: **Wonderful work. The answer is 910 LE.**

TEACHER DO: Add the answer to the equation on the board.

3. TEACHER SAY: **Let's try another one. Work with your partner to put 290 LE on your mat.**

STUDENTS DO: Put 290 LE on their mat.

TEACHER SAY: **Now add 475 LE to your mat.**

STUDENTS DO: Add 475 LE to their mat.

TEACHER DO: Write 290 LE + 475 LE = _____ on the board.

TEACHER SAY: **Now add the 1 LE notes in the Ones column. Give me a Thumbs Up when you and your partner are done. I will select a pair of you to share your answer and show your work at the board.**



STUDENTS DO: Add the 1 LE notes. Give a **Thumbs Up** when they are done. Selected students share their answer and demonstrate their work at the board.

TEACHER DO: Repeat the procedure for the banknotes in the Tens column and then the Hundreds column. Have students share their answers and demonstrate their work. Encourage them to answer other students' questions.



STUDENTS DO: Continue to work together to regroup and add the money on their mat. Selected students share their answers and explain how they solved the problem. Seated students ask questions if needed.

4. TEACHER DO: If time allows, repeat the procedure with another problem, such as 749 LE + 65 LE.



STUDENTS DO: Continue to work together to regroup and add the money on their mat. Selected students share their answers and explain how they solved the problem.

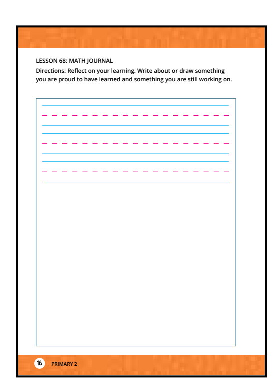
TEACHER SAY: **Great work today solving money problems with addition and subtraction. Leave out your student book for Reflect.**



Reflect (5 minutes)

Directions

Note to the Teacher: Today students reflect on everything they have learned over the last couple of weeks. They identify something they are proud of learning and something they are still working on. This type of reflection helps build students' awareness of and responsibility for their own learning and helps them appreciate their progress over time.



1. TEACHER SAY: **For Reflect today, I want you to think about all we have been working on over the last couple of weeks. What is one thing you are proud of learning? What is one thing you are still working on? Write about or draw your thoughts and ideas on page Lesson 68: Math Journal.**



STUDENTS DO: Reflect on their learning. Identify something they are proud to have learned and something they are still working on. Record ideas in the student book.

TEACHER DO: As students work, walk around and review some of their entries. Ask some students to explain or elaborate. The Math Journal pages are an excellent source of formative assessment data.

TEACHER SAY: **Good work today. You are such wonderful thinkers in mathematics. We all have things we are still working on and I am very proud of you. Put away your student book for today.**



STUDENTS DO: Put away student book.

Lesson 69 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply place value concepts to subtract money with regrouping. • Subtract 2- and 3-digit numbers with regrouping.	• Review vocabulary as needed.	• Calendar Math area • Large set of Egyptian banknotes (1, 10, and 100 LE) • Student sets of banknotes (one set per student) • Mathematics Student Book and pencil • Poster of place value/ money mat

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Complete calendar routine as done in previous lessons.

1. TEACHER DO: Use **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Collect and record data for the class graph.



STUDENTS DO: Help the teacher collect and graph data. Answer questions about the day's data.

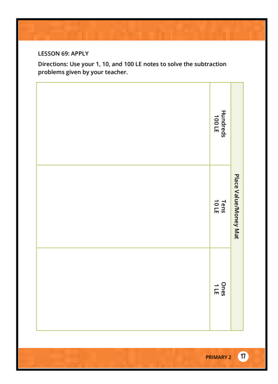


Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students continue to connect their understanding of place value to the 1, 10, and 100 LE notes. This lesson focuses on subtracting with regrouping. The process of students working with the teacher, working with a partner, and showing their work is repeated. Note that students are working with their ***Shoulder Partner*** *in this lesson. However, if they do not have enough banknotes to solve the subtraction problems, have them work in teams of three instead.*

1. TEACHER DO: Display the place value/money mat on the board. Have your large banknotes nearby.



TEACHER SAY: Yesterday, we added money using a place value/money mat and 1 LE, 10 LE, and 100 LE banknotes to help us with regrouping. Today we are going to work on regrouping again, but in subtraction problems. Regrouping in subtraction is different from regrouping in addition, so we will practice some problems together before you work with a partner to solve some on your own. Open your Mathematics Student Book to page Lesson 69: Apply. Take out your 1, 10, and 100 LE banknotes.

 **STUDENTS DO:** Open student book to page Lesson 69: Apply. Take out 1, 10, and 100 LE banknotes.

TEACHER SAY: Like yesterday, there is a place value/money mat on the page. I also have one on the board. Let's begin. Work with your Shoulder Partner to show 325 LE on your mat.

 **STUDENTS DO:** Work with **Shoulder Partner** to show 325 LE on their mat.

TEACHER DO: Show 325 LE on your large mat.

TEACHER SAY: Let's subtract 119 LE.

TEACHER DO: Write 325 LE – 119 LE = _____ on the board.

TEACHER SAY: Where do we always begin when we add or subtract?

 **STUDENTS DO:** Call out: Ones place.

TEACHER SAY: Correct. Let's look at the Ones column. How many Ones are there in 325 LE? Call out if you know.

 **STUDENTS DO:** Call out: 5.

TEACHER SAY: How many Ones are there in 119 LE?

 **STUDENTS DO:** Call out: 9.

TEACHER SAY: We have 5 Ones and have to subtract 9. Can we do that? Hold up 5 fingers.

 **STUDENTS DO:** Hold up 5 fingers.

TEACHER SAY: Now, subtract 9 fingers.

 **STUDENTS DO:** Try to subtract 9 fingers. Students should recognize that they cannot.

TEACHER SAY: We do not have enough Ones to subtract 9. When that happens, we must decompose a Ten and bring it over to the Ones place. Watch.

TEACHER DO: Take one of the 10 LE notes from the Tens column on your mat. Hold it up so all students can see it.

TEACHER SAY: I have one of the 10 LE notes from the Tens column. How many 1 LE notes is this worth? Call out if you know.

 **STUDENTS DO:** Call out: 10.

TEACHER SAY: Yes, one 10 LE note is worth ten 1 LE notes. I take my 10 LE note and I decompose it into ten 1 LE notes. Now that they are 1 LE notes, they can go in the Ones column. Now you do it. Take one of your 10 LE notes and regroup it into ten 1 LE notes. Place them in the Ones column with the rest of the 1 LE notes.

 **STUDENTS DO:** Regroup one 10 LE note into ten 1 LE notes. Place them in the Ones column.

TEACHER SAY: Now how many 1 LE notes do we have now?



STUDENTS DO: Add notes. Call out: 15.

TEACHER SAY: We have 15. Can we subtract 9 now?



STUDENTS DO: Call out: yes.

TEACHER SAY: Yes. Subtract 9 and raise your hand when you and your partner have an answer.

STUDENTS DO: Subtract 9 from 15. Raise hand when ready. Selected students share their answer and demonstrate their work at the board.

TEACHER SAY: Great work. Now how many 10 LE notes do we have in the Tens column?



STUDENTS DO: Call out: 1.

TEACHER SAY: Yes. We started with two 10 LE notes, but we regrouped one of them and moved it to the Ones place so we could subtract. Now we have one 10 LE note left. Look at our problem. How many Tens do we need to subtract?

STUDENTS DO: Look at the problem. Call out: 1.

TEACHER SAY: Yes. Take one 10 LE note away from your Tens column. What is 1 minus 1?



STUDENTS DO: Call out: 0.

TEACHER SAY: Let's look at the Hundreds column. How many 100 LE notes do we have?



STUDENTS DO: Call out: 3.

TEACHER SAY: Yes. Look at our problem. How many Hundreds do we need to subtract?

STUDENTS DO: Look at the problem. Call out: 1.

TEACHER SAY: Subtract one of the 100 LE notes from your Hundreds column. Raise your hand when you have an answer.

STUDENTS DO: Subtract one 100 LE note. Raise hand when finished. Selected students share their answers and demonstrate their work at the board.

TEACHER DO: Write the answer to the equation on the board: 325 LE – 119 LE = 206.

TEACHER SAY: Great work. Let's try another one together.

TEACHER DO: In the time left in the Learn segment, repeat the procedure with additional subtraction problems with one instance of regrouping, such as 468 LE – 293 LE. Help students understand that regrouping a 100 LE note into ten 10 LE notes is the same process they followed in the first problem. Have students share their answers, explain their thinking, and demonstrate their work whenever possible.

STUDENTS DO: Work with their **Shoulder Partner** to solve subtraction problems with regrouping. Selected students share their answers, explain their thinking, and demonstrate their work at the board.

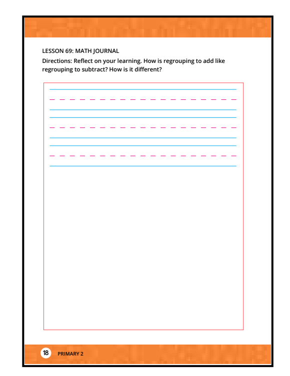
TEACHER SAY: That was a lot of hard work. You are learning so much and I love hearing your thinking. Please keep your student book out and put away your banknotes.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students used money and a place value/money mat to strengthen and apply their understanding of place value, subtraction, and regrouping. For Reflect, they are asked to think about the process of regrouping and write about it.



LESSON 69: MATH JOURNAL

Directions: Reflect on your learning. How is regrouping to add like regrouping to subtract? How is it different?

PRIMARY 2

1. TEACHER SAY: **Turn in your student book to page Lesson 69: Math Journal.**

 STUDENTS DO: Turn in the student book to page Lesson 69: Math Journal.

TEACHER SAY: **Today, we practiced subtracting with regrouping. In our last math lesson, we practiced adding with regrouping. Think for a moment about the work you did today and yesterday. How is regrouping to add like regrouping to subtract? How is it different? After you have thought about your answer, write about or draw your thinking in your student book on the Math Journal page.**

 STUDENTS DO: Reflect and then record their thinking in their student book.

TEACHER DO: As students are working, walk around and read some of their entries. Ask some students to explain or elaborate on their thinking. After about three minutes, use an **Attention Getting Signal**.

TEACHER SAY: **I enjoyed reading your journal entries. It helps me understand how you think about mathematics. Please give yourselves a pat on the back and put away your student book for today.**

 STUDENTS DO: Pat themselves on the back and put away student book.

Lesson 70 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Apply place value concepts to solve story problems involving money.
- Add and subtract 2- and 3-digit numbers with regrouping.

KEY VOCABULARY

- Review vocabulary as needed.

MATERIALS

- Calendar Math area
- Large set of Egyptian banknotes (1, 10, and 100 LE)
- Student sets of banknotes (one set per student)
- Mathematics Student Book and pencil
- Poster of place value/ money mat
- Money Story Problem Cards (one set for each group of four or five students)

LESSON PREPARATION FOR THE TEACHER

Prepare a list of student groups in advance to ensure that there is at least one strong reader in each group and to facilitate transition to group work.

Print out copies of the Money Story Problem Cards Blackline Master. You will need one copy for each small group of 4 or 5 students.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, students analyze the graph they created in Lessons 66 to 69.

1. TEACHER DO: Use **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math, including the day and date section and the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the past math lessons, we have collected data about how we get to school. Today we are going to look at the graph we made and answer some questions about the data.

TEACHER DO: Ask students questions about the graph. Examples are below.
- Which day had more students walking than not walking?
- Which day had the most walkers/not walkers?
- Which day had the fewest walkers/not walkers?
- Which day had the most students in total?
- Why might more students walk/not walk to school on a given day?
- What other questions could you answer by looking at this graph?



STUDENTS DO: Analyze the class bar graph and answer questions about the data.



Learn (40 minutes)

Directions

Note to the Teacher: For this last lesson in the chapter, students work in teams of four or five to solve story problems involving money. The problems involve regrouping and place value to the Hundreds place. Students can use their place value/money mats and their banknotes to help them solve the problems. Working in teams will give struggling students an opportunity to learn from students who understand the concepts. Additionally, students who are excelling will benefit from explaining their thinking to others.

1. TEACHER DO: Display your large place value/money mat on the board and have your large banknotes nearby. Write the following on the board:

Amirah went to the market and bought milk, eggs, chicken, and apples. She spent 226 LE. On her way home, she bought some coffee for 28 LE. How much money did she spend in all?

TEACHER SAY: I have written a story problem on the board. I am going to read the problem aloud. Then you will Turn and Talk to your Shoulder Partner about whether this problem is an addition or a subtraction problem. Give a Thumbs Up when you are ready to share your answer and explain your thinking.

TEACHER DO: Read the story problem aloud two times to ensure everyone heard it and understood.

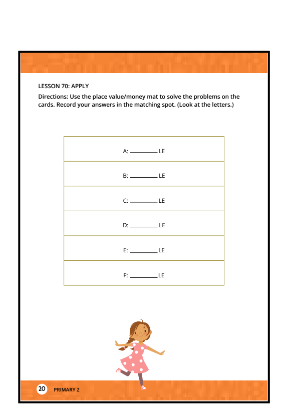
 **STUDENTS DO:** Listen to story problem and then talk to **Shoulder Partner** about whether the problem is an addition or a subtraction problem. Give a **Thumbs Up** to share thinking.

TEACHER DO: Confirm accurate thinking and clear up any misconceptions. If necessary, explain why the problem is an addition problem.

TEACHER SAY: Yes, this problem is an addition problem because it asks us to find the TOTAL amount of money that Amirah spent. She spent some at the market and some on coffee and asks us how much she spent IN ALL. Since we have to combine the amounts to answer that question, it is an addition problem. Raise your hand if you would like to come up and show how we could solve this problem using our banknotes and our place value mat.

 **STUDENTS DO:** Raise hand to volunteer. Selected student demonstrates how to solve the problem and explains their thinking.

TEACHER DO: Help the student regroup or allow the student to select a friend to help them solve the problem.



TEACHER SAY: Good job. Amirah spent 254 LE. Now it is your turn. Take out your Mathematics Student Book and turn to page Lesson 70: Apply.

 **STUDENTS DO:** Take out student books and turn to page Lesson 70.

TEACHER SAY: On this page, you have a place value/money mat and boxes with letters. Each letter matches a card with a story problem on it. This card has the letter A at the top.

TEACHER DO: Show the card with the A printed on the top left-hand side.

TEACHER SAY: For each card, one person in the group will read the story problem aloud. Reading it more than once helps make sure we understand the facts of the problem and what is being asked. You will work together, using your banknotes to solve the problem. You will record your answer to card A in box A in your student book. Raise your hand if you have questions.

 **STUDENTS DO:** Raise hand if they have questions.

TEACHER DO: Answer students' questions, if any.

TEACHER SAY: Let's try Card A together. After I read the problem aloud, turn to your Shoulder Partner and decide if we should add or subtract to find the answer. Be sure you can explain your thinking.

TEACHER DO: Read the problem aloud two times. Wait for students to turn and discuss problem.

Problem A: Omar had 750 LE saved for a bike. The one that he wanted was 625 LE. After he buys the bike, how much money will he have left?

 **STUDENTS DO:** Listen to problem and then turn to **Shoulder Partner**. Discuss whether they need to add or subtract.

TEACHER SAY: Now that you have talked with your Shoulder Partner, pop up if you think this is an addition problem.

 **STUDENTS DO:** Pop up if they think it is an addition problem.

TEACHER DO: Select one standing student to explain why they think it is an addition problem.

 **STUDENTS DO:** Selected student explains their thinking.

TEACHER SAY: Pop up if you think we need to subtract.

 **STUDENTS DO:** Pop up if they think it is a subtraction problem.

TEACHER DO: Select one standing student to explain why they think it is a subtraction problem.

 **STUDENTS DO:** Selected student explains their thinking.

TEACHER SAY: It is interesting to hear how different people would solve this problem. Since Omar is spending money, many people would say that this is a subtraction problem. We need to see how much money is left after the 625 LE is spent. But some mathematicians might use addition and count up from 625 LE to 750 LE to find the difference. Flexible thinking is important in math. Let's use subtraction to solve this problem. Since Omar started with 750 LE, work with your Shoulder Partner to put 750 LE on your mat.

 **STUDENTS DO:** Work with their **Shoulder Partner** to put 750 LE on their mat.

TEACHER DO: Put 750 LE on your large mat on the board.

TEACHER SAY: Now work with your Shoulder Partner to subtract the 625 LE he wants to spend on a bike. Be sure to help each other.

 **STUDENTS DO:** Work with their **Shoulder Partner** to subtract 625 LE.

TEACHER DO: Select a pair of students to show their work and explain their thinking.

 **STUDENTS DO:** Selected students share their work at the board and explain their thinking.

TEACHER SAY: Great work. Record the answer in your student book in box A.

 **STUDENTS DO:** Record answer A in their student book.

TEACHER SAY: Now it is your turn. I am going to put you into small groups. Each group will get a set of cards with story problems just like the one we practiced. I will assign one person as the reader. The reader will read the card aloud, and then everyone will work together to solve the problem. Then you will write the answer in your student book. Share banknotes as needed and help each other.

TEACHER DO: Assign students to groups and tell each group where to sit. Give each group a set of story problem cards.



STUDENTS DO: Move with group to sit together, taking student books and banknotes. Reader reads each problem aloud at least twice. Students work together to solve the problems.

Note to the Teacher: As an extension activity, have students who finish early write problems for each other and solve them.

TEACHER DO: Walk around the classroom and observe students as they work and talk. Note students who are struggling to understand the problems or determine how to solve them. When the Learn segment is over, use an **Attention Getting Signal**.

TEACHER SAY: Good work today. It is alright if you did not get all the cards finished. We will practice story problems throughout the school year. Return to your seats and put away your banknotes, but keep out your student book and pencil.



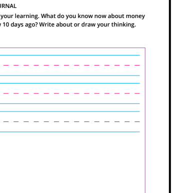
STUDENTS DO: Return to seats and put away banknotes, but keep out student book and pencils.



Reflect (5 minutes)

Directions

Note to the Teacher: Students have spent the last 10 lessons learning about and working with money. In this final Reflect for the chapter, students write about what they now understand about money that they did not understand 10 lessons ago. If there is time, have students share their journal entries with the class. Regardless, be sure to look at the Mathematics Student Book later as their journals are a valuable source of formative assessment data.



LESSON 70: MATH JOURNAL

Directions: Reflect on your learning. What do you know now about money that you did not know 10 days ago? Write about or draw your thinking.

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1. **TEACHER SAY: Turn in your student book to page Lesson 70: Math Journal.**

STUDENTS DO: Turn in their student book to page Lesson 70: Math Journal.

TEACHER SAY: During the last 10 days, you have worked with money a lot and learned so much. For Reflect today, think about what you now know about money that you did not know 10 lessons ago. Write about or draw your thinking in your student book. If there is time, we will share.



STUDENTS DO: Reflect on their learning. Record their thinking in their student book.

TEACHER DO: Give students three minutes to write their Math Journal entries. If time allows, select a few students to share their reflections with the class.

TEACHER SAY: Great work today. Turn to your Shoulder Partner and give them a high five. Then put away your student book. You have all worked hard for the past 10 lessons. Money is something we all need to understand, so you should be proud of yourselves.



STUDENTS DO: Give their **Shoulder Partner** a high five. Put away student book.

PRIMARY 2

Mathematics

HOW THE WORLD WORKS

Chapter 2

Lessons 71 to 80

Lessons 71 to 80

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 71 to 80, students will work toward the following learning indicators:

B. OPERATIONS AND ALGEBRAIC THINKING:

2.a. Determine whether the number of objects in a group (up to 20) is even or odd.
2.b. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns.
2.c. Write an equation to express the total number of objects in an array as a sum of equal addends.

C. NUMBERS AND OPERATIONS IN BASE TEN:

1.d. Completes number patterns up to five (5) places.
1.e. Creates new number patterns on his/her own.

Computational Thinking

C. NUMBERS AND OPERATIONS IN BASE TEN:

1.d. Completes numerical patterns up to five (5) places.
1.e. Creates new numerical patterns on his/her own.

CH 2 Pacing Guide

LESSON	INSTRUCTIONAL FOCUS
71	Students will: • Participate in Calendar Math activities. • Determine whether a number is even or odd.
72	Students will: • Participate in Calendar Math activities. • Describe a number as even or odd. • Determine whether doubling a number results in an even or odd sum.
73	Students will: • Participate in Calendar Math activities. • Find the sum of two numbers. • Determine whether adding an even and an odd number results in an even or odd sum.
74	Students will: • Participate in Calendar Math activities. • Identify the rule for a number pattern. • Extend a number pattern two places.
75	Students will: • Participate in Calendar Math activities. • Apply a rule to create a number pattern up to five places. • Add or subtract to extend a pattern.
76	Students will: • Participate in Calendar Math activities. • Match a rule to a number pattern. • Extend number patterns using a given rule. • Create a pattern rule and matching number pattern.
77	Students will: • Participate in Calendar Math activities. • Identify the rule in a number pattern. • Create addition and subtraction pattern rules. • Extend number patterns to five places using a given rule.
78	Students will: • Participate in Calendar Math activities. • Define array. • Identify arrays and non-arrays. • Create an array.
79	Students will: • Participate in Calendar Math activities. • Use repeated addition to find the total number of objects in arrays. • Write addition equations to express the total number of objects in an array.

LESSON	INSTRUCTIONAL FOCUS
80	Students will: • Participate in Calendar Math activities. • Write addition equations to express the total number of objects in an array. • Design an array using repeated addition.

Chapter Preparation for Teacher

For Lesson 71:

- If you do not already have one, create a schedule for the day (for example, school begins, reading instruction, math instruction, break, Arabic instruction, school ends, and so on). Next to each time on the schedule, draw or display an analog clock showing the time.
- Gather sets of 20 counters (one set per pair of students). For example, dry beans, dry pasta, or small pebbles.
- Make an Even/Odd chart for the board (similar to the one in the Mathematics Student Book). An example is shown below.

Even	Odd

For Lesson 72:

- Gather sets of 40 counters (one set per pair of students).

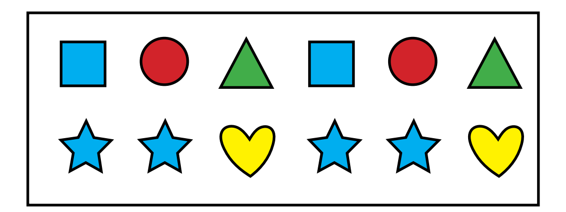
For Lesson 73:

- Print sets of number cards 1–10 (one set per pair of students). See the Number Cards 1–10 Blackline Master.
- Draw on the board the chart shown below.

Equation	Sum	Even or Odd?
4 + 5	9	odd

For Lesson 74:

- Create a shape pattern poster, such as the one shown below. Display the poster prior to starting Lesson 74.



For Lesson 75:

- Print out sets of Pattern Rule Cards (one set per group of four students). See the Pattern Rule Cards Blackline Master.
- Cut strips of paper (about 5 cm x 15 cm) for pattern work (at least 10 strips per group of four students).

For Lesson 77:

- Print Number Pattern Caterpillar Blackline Master (one per student).
- Create a completed model of the Number Pattern Caterpillar craft to show students. Completed craft should look similar to this (number patterns will vary):



For Lesson 78:

- Create posters showing arrays and non-arrays. Do not label the posters. Examples are shown below.

Array	Non-Array
× × × × × × × × × × × ×	× × × × × × × × × ×
▲ ▲ ▲ ▲ ▲ ▲	▲ ▲ ▲ ▲ ▲
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4

- Cut sets of 12 squares about 5 cm x 5 cm for students. (Each student needs 12 squares.)

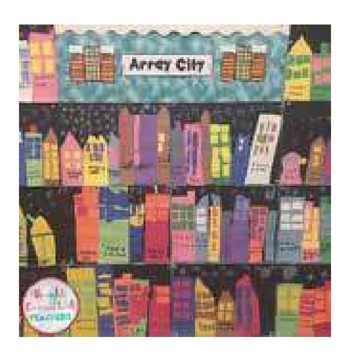
For Lesson 79:

- Create or print a blank ten frame to model an array for students.

For Lesson 80:

- Gather sets of 20 counters (one set per pair of students).
- In this lesson, each student will design a building with one array. Gather assorted colors of construction paper for students to use.
    - To save class time, consider cutting the construction paper into various rectangular building shapes in advance. This will reduce the amount of time students spend designing their buildings and will allow you to control the size of your final Array City.

- Students will put their buildings together to create an Array City. An example is shown below.



- Create an example of an array building for students to see. The building should be one color and the windows (the array) should be a different color that is easy to see on the building.

Materials Used

Calendar math area



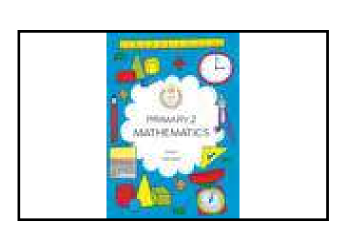
Even/odd chart



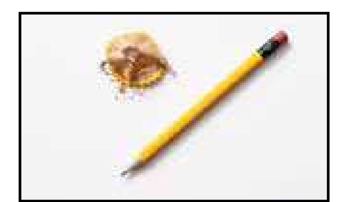
Counters



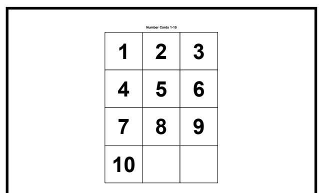
Student book



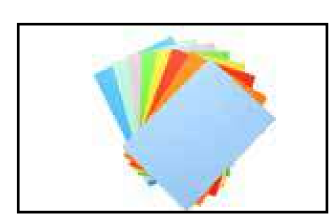
Pencil



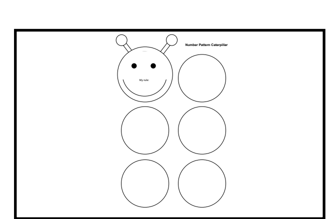
Number cards



Construction paper



Pattern caterpillar



Scissors



Crayons



Black marker



Pre-cut squares

Strips of paper

Poster of arrays and non-arrays

Shape pattern poster

Chart of sums

Lesson 71 Overview

LEARNING OBJECTIVES
Students will: • Participate in Calendar Math activities. • Determine whether a number is even or odd.

KEY VOCABULARY
• Equal • Even • Left over • Odd • Partners

MATERIALS
• Calendar Math area • Even/Odd chart • Sets of 20 counters (one set per pair of students) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER
Create an Even/Odd chart for the board. See Chapter Preparation for the Teacher for details. Gather sets of 20 counters (one set per pair of students).



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, students review time using your schedule for the day. For the next 10 days, next to each section of your day, place or draw an analog clock image and record what time that subject or event will happen. For example, have clocks that show what time break starts, what time math starts, and so on.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

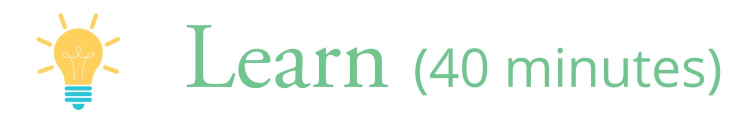
2. TEACHER SAY: For the last 10 days, we have collected data, made bar graphs, and analyzed the data in the graphs. For the next five days, we are going to review telling time. On our schedule, I have placed analog clocks for when different parts of our day take place. Let's look at these clocks and practice telling time.

TEACHER DO: Ask two questions about the daily schedule, such as the following:

- At what time will we have break?
- What time does math start?
- When will the school day be over?
- When will we have writing/reading?
- Which clock shows something that starts at a quarter after? A quarter to? A half hour?

Ask different students, using **Calling Sticks** or having students raise hands to answer.

 **STUDENTS DO:** Selected students answer questions about time, sharing verbally or by recording the time (as directed by the teacher).



Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students explore the concept of even and odd. They consider how even numbers form partners and odd numbers have a leftover. Even and odd numbers were not discussed in Primary 1, so this will be a new concept, although some students may have some understanding of even and odd.

1. TEACHER DO: Display your Even/Odd chart on the board.

Even	Odd

TEACHER SAY: Mathematicians group numbers into many categories. Two of those categories are even numbers and odd numbers. Give me a Thumbs Up if you know what even or odd mean. You can give an example of an even or odd number or tell us something else you might know about even and odd.

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share what they know about even and odd numbers.

TEACHER SAY: Great ideas. Let's look at these two categories of numbers more closely. I have put a chart on the board for us to record numbers that are even and odd. But first we have to make sure we know what even and odd mean. I will pull 10 Calling Sticks. If I call your name, come to the front of the class.

 **STUDENTS DO:** Selected students go to the front of the class.

TEACHER SAY: There are 10 students here. I want each of you to find a partner and stand together.

 **STUDENTS DO:** Helpers find a partner and stand next to each other.

TEACHER SAY: Good job. Every one of the 10 students found a partner. Everyone has a partner because 10 is an EVEN number. We can divide evenly into two groups without having any left over.

TEACHER DO: Record 10 on the chart in the Even column. Have helpers sit.

 **STUDENTS DO:** Helper return to seats.

2. TEACHER SAY: Let's try another number. I am going to pull 6 Calling Sticks. If your name is called, come to the front.

 **STUDENTS DO:** Selected students go to the front of the class.

TEACHER SAY: Each of you see if you can find a partner and stand next to them.

STUDENTS DO: Helpers find a partner and stand next to each other.

TEACHER SAY: Did all 6 people find a partner?

 **STUDENTS DO:** Call out: Yes.

TEACHER SAY: Yes, everyone found a partner, so 6 is also an even number. I am going to record it on our chart on the board.

TEACHER DO: Record 6 on the chart in the Even column. Repeat the process, calling 4 students.

 **STUDENTS DO:** Selected students go to the front of the room and find partners.

3. **TEACHER SAY: So we know that 4, 6, and 10 are even numbers. What do you think will happen if we have 7 students come to the front of the room? Will everyone have a partner? Share your prediction with your Shoulder Partner.**

 **STUDENTS DO:** Share prediction with **Shoulder Partner**.

TEACHER SAY: Let's test your predictions together.

TEACHER DO: Call 7 students to the front using the **Calling Sticks**.

 **STUDENTS DO:** Selected students go to the front of the room.

TEACHER SAY: See if each of you can find a partner.

 **STUDENTS DO:** Helpers try to find a partner. One student will be left over without a partner.

TEACHER SAY: Was everyone able to find a partner?

 **STUDENTS DO:** Call out: no.

TEACHER SAY: We have 7 students and not everyone could find a partner. One person was left over. What type of a number do you think 7 might be? Lean and Whisper.

 **STUDENTS DO: Lean and Whisper**: odd.

TEACHER SAY: Yes, 7 is ODD because there was 1 left over. Odd numbers cannot make perfect partners or buddies. One will be left out.

TEACHER DO: Record 7 in the Odd column.

TEACHER SAY: What other numbers do you think might be odd? Raise your hand if you have an idea of another number we should test.

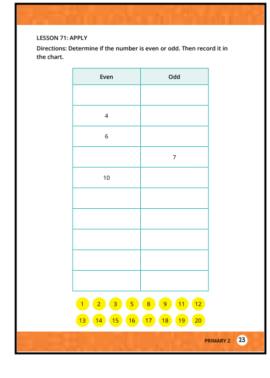
 **STUDENTS DO:** Raise hand to share another number. Selected students share their thinking about other odd numbers.

TEACHER DO: For each student's suggestion, use the **Calling Sticks** to choose that many students to come to the front. For example, if a student suggests 5 as an odd number, call 5 students to the front. Ask students to find a partner and stand next to the partner. Guide discussion about whether the numbers are even or odd. Have the student who suggested the number record the number in the right column.

 **STUDENTS DO:** Helpers go to the front and try to find a partner.

4. **TEACHER SAY: Now it is going to be your turn. Take out your Mathematics Student Book and turn to page Lesson 71: Apply.**

 **STUDENTS DO:** Take out Mathematics Student Book and turn to page Lesson 71: Apply.


LESSON 71: APPLY

Directions: Determine if the number is even or odd. Then record it in the chart.

Even	Odd
4	
6	
	7
10	

1 2 3 5 8 9 11 12
13 14 15 16 17 18 19 20

PRIMARY 2 23

TEACHER SAY: On the page, you will see an even and odd chart like the one on the board. You will notice that 10, 6, and 4 are already written in the Even column. Those were numbers that could find partners with no leftovers. They were even. You will notice 7 is in the Odd column since it had 1 leftover.

TEACHER DO: Direct students to copy the other numbers on the class Even/Odd chart into their student book.

 **STUDENTS DO:** Copy the other odd numbers into the chart in the student book.

TEACHER SAY: For the rest of math class, you will test numbers and see if they are even and can make partners perfectly, or if they have a leftover and are odd. Under the chart in your book, you will see a list of numbers from 1 to 20. Let's cross out the numbers we have already added to the chart.

 **STUDENTS DO:** Cross out 4, 6, 7, 10, and any numbers on the class Even/Odd chart.

TEACHER SAY: Great job. I am going to give you 20 counters. Work with your Shoulder Partner to test each number that is not crossed out to see if it is even or odd. You can use the counters to see if you can make equal partners or if there will be a leftover. After you determine if the number is even or odd, record it in your chart.

TEACHER DO: Hand out sets of 20 counters to each pair of students.

 **STUDENTS DO:** For the rest of Learn time, work with **Shoulder Partner** to test numbers 1 to 20 for even or odd.

TEACHER DO: Walk around and observe students as they work. Offer help to students who are struggling. If any students have identified another effective and efficient way to determine whether numbers are even or odd, have them share it with the class. For example, some students may have discovered that even numbers can be split into two equal groups. When Learn time has 2 to 3 minutes left, use an **Attention Getting Signal** to bring the group back together.

5. TEACHER SAY: Let's talk about what you discovered. Raise your hand and share two odd numbers that you found. You will also record them on our chart.

 **STUDENTS DO:** Raise hand to volunteer. Selected student shares two odd numbers and records them on the chart.

TEACHER DO: Record the two odd numbers and then continue to ask for even and odd numbers. Selected students record their numbers on the class chart for 2 to 3 minutes or until the chart is filled for numbers 1 to 20.

Note to the Teacher: If not all of the numbers have been tested, leave them blank. Students can test them during free time or in the next math class.

TEACHER SAY: Great work. Please keep your student books out for Reflect. Give me a Thumbs Up if you can summarize what we learned about even and odd numbers.

 **STUDENTS DO:** Raise hand to volunteer. Selected students share their thinking.

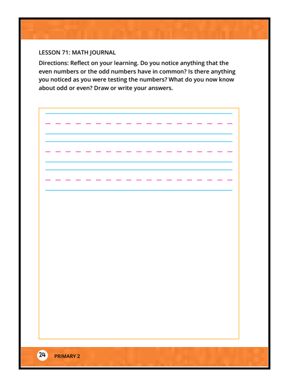
TEACHER DO: Confirm correct statements and correct misconceptions.



Reflect (5 minutes)

Directions

Note to the Teacher: During Reflect, students look at their Even/Odd chart and see if they notice anything about the numbers. Some students may notice that the even numbers are 2, 4, 6, 8, 10, and so on, skip counting by 2s. Some may notice that the even numbers are all doubles.



LESSON 71: MATH JOURNAL

Directions: Reflect on your learning. Do you notice anything that the even numbers or the odd numbers have in common? Is there anything you noticed as you were testing the numbers? What do you now know about odd or even? Draw or write your answers.

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1. TEACHER SAY: **Turn to page Lesson 71: Math Journal in your student book.**



STUDENTS DO: Turn to page Lesson 71: Math Journal in the student book.

TEACHER SAY: **Today we tested numbers 1 to 20 to see if they were even or odd. For Reflect today, look at your Even/Odd chart. Notice what numbers are in each column. Do you notice anything that the even numbers have in common? Do you notice anything the odd numbers have in common? Do you see any patterns? Think for a moment and then write or draw your thinking in your student book on the Math Journal page.**

Note to the Teacher: Identifying patterns is an important skill in computational thinking. Patterns can take many forms include, shapes, number, colors, or actions. Identifying patterns in a non-pattern context (for example, a chart of odd and even numbers) helps students build connections between new and previously-learned concepts. Encourage students to look for patterns everywhere as they learn to make sense of mathematics and the world around them.



STUDENTS DO: Write or draw observations about even and odd numbers.

TEACHER DO: After 3 to 4 minutes, use an **Attention Getting Signal**.

TEACHER SAY: **Great work today. We will look at even and odd numbers again tomorrow. Give your Shoulder Partner a high five and put away your student book for today.**



STUDENTS DO: High-five their **Shoulder Partner** and then put away student books.

Lesson 72 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Describe a number as even or odd.
- Determine whether doubling a number results in an even or odd sum.

KEY VOCABULARY

- Doubles
- Even
- Odd
- Sum

MATERIALS

- Calendar Math area
- Even/Odd chart
- Sets of 40 counters (one set per pair of students)
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather sets of 40 counters (one set per pair of students).



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time like we did yesterday.

TEACHER DO: Ask two questions about the daily schedule, such as the following:
- At what time will we have break?
- What time does math start?
- When will the school day be over?
- When will we have writing/reading?
- Which clock shows something that starts at a quarter after? A quarter to? A half hour?

Ask different students, using **Calling Sticks** or having students raise hands to answer.



STUDENTS DO: Selected students answer questions about time, sharing verbally or by recording the time (as directed by the teacher).



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students continue to explore even and odd numbers and review doubles facts (for example, 2 + 2, 5 + 5, and so on). Students discover that the sums of doubles are even regardless of whether the number doubled is even or odd.

If students did not finish filling out the Even/Odd chart yesterday, you can begin the class by testing the remaining numbers together and completing the chart. Students should copy the new numbers into their Mathematics Student Book.

1. TEACHER SAY: **Yesterday we learned about two categories of numbers—even and odd. We learned that even numbers can make partners and have none left over, but odd numbers always have one left over. Our Even/Odd chart is on the board. Look at the chart and then turn to your Shoulder Partner and tell them four odd numbers and four even numbers.**

 STUDENTS DO: Turn to **Shoulder Partner** and share four odd and four even numbers.

TEACHER DO: Point to each number in the chart as you review.

TEACHER SAY: **Good job. We can see from our chart that 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20 are even, and 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19 are odd. Turn and Talk to your Shoulder Partner again and think about any pattern you notice. It could be something you wrote about yesterday during our Reflect time. I will use Calling Sticks to choose students to share.**

 STUDENTS DO: **Turn and Talk** to **Shoulder Partner** about the pattern of even numbers and odd numbers. Selected students share what they notice about even and odd numbers.

TEACHER DO: If no student mentions that the 2, 4, 6, 8, 10 repeats in the teens, mention and explain this pattern. Circle the digits in the Ones place to show students the repeating pattern. Do the same for the odd numbers as well.

TEACHER SAY: **Good job. We know that even numbers make partners and are also numbers that end in 2, 4, 6, 8, 0. Odd numbers have a leftover and end in 1, 3, 5, 7, 9. We circled the digit that was in the Ones place to see this pattern. 14 is on the even side, and it has an even number of Ones—4. 13 is on the odd side, and it has an odd number of Ones—3, but they both have a 1 in the Tens place. So do you think the number 23 would be even or odd? Pop up if you think even. Clap if you think odd.**

 STUDENTS DO: Pop up or clap based on whether 23 is even or odd.

TEACHER SAY: **Let's look closely at 23. It is not on our chart. I am going to circle the digit in the Ones place as I did for the other numbers in the chart. It is a 3, and 3 is an odd number, so maybe 23 is odd like 13, but 2 is even so maybe 23 is even? I have an idea: I can use counters to test it. Give me a Thumbs Up if you would like to come up to help me check whether 23 is even or odd.**

 STUDENTS DO: Give a **Thumbs Up** to volunteer. Selected student goes to the front of the room.

TEACHER DO: Display 23 counters. Have student volunteer help you make partners until one counter is left over.

TEACHER SAY: **23 is odd. We have one counter left over and it has an odd number of Ones. Is it always true that if a number has an odd number in the Ones place, it is an odd number? Give me a Thumbs Up if you think that is a true statement. Give me a thumbs down if you disagree or are not sure.**

 STUDENTS DO: Give a **Thumbs Up** to agree with the statement. Give a thumbs down if they disagree or are not sure.

2. TEACHER SAY: As we continue to work on even and odd numbers, check that idea to see if it always works. I would like to hear what you find out. Today we are going to figure out what happens when we double even and odd numbers. We already discussed the number 3 and know that 3 is odd. It makes one pair of partners with one left over. But what would happen if I had a group of 3 and added it to another group of 3? What is 3 + 3? If we add two odd numbers, is the sum even or odd? Turn and Talk to your Shoulder Partner and give me a Thumbs Up to share your thinking.



STUDENTS DO: Turn and Talk to **Shoulder Partner** about whether the sum of 3 and 3 is even or odd. Give a Thumbs up to share thinking. Selected students share their thinking.

TEACHER SAY: Let's try our partner test again. I will call up 3 students and then another 3.

TEACHER DO: Use **Calling Sticks** to choose 3 students. Then choose another 3. Have students stand in two groups of 3.



STUDENTS DO: Selected students go to the front of the room.

TEACHER SAY: I have 3 students, which we learned yesterday was odd. I cannot make equal partners with these 3 students. Then I have another 3 students. I cannot make equal partners with these 3 students either. Now let's put the two groups of 3 together. What is the sum? Lean and Whisper.



STUDENTS DO: Lean and Whisper: 6.

TEACHER SAY: Yes, 3 + 3 = 6. Is 6 even or odd? Pop up if you think 6 is even. Stay seated if you think 6 is odd.



STUDENTS DO: Pop up if they think 6 is even. Stay seated if they think 6 is odd.

TEACHER SAY: Can we make perfect partners with these 6 students? I would like my helpers to see if they can find a partner.



STUDENTS DO: Helpers find a partner.

TEACHER SAY: We can. That means 6 is even. We doubled an odd number, but we got an even sum. What do you think will happen if we double an even number? Raise your hand to tell me an even number.



STUDENTS DO: Raise hand to volunteer. Selected student shares an even number.

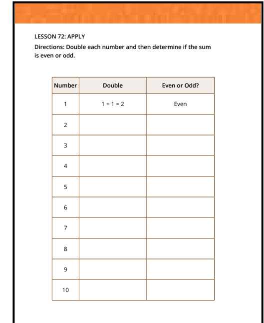
TEACHER DO: Draw one set of _____ (student's number) dots on the board. Then draw a second set of the same number. Group the dots into partners to show that the sum is even.

TEACHER SAY: Is the sum even or odd? Tell me.



STUDENTS DO: Call out: even.

TEACHER SAY: The sum is even. So when we doubled an odd number—3—we got an even sum. When we doubled an even number—_____ (the student's number)—we also got an even sum. Do you think we will always get an even sum if we double an even or an odd number? Let's find out. Open your Mathematics Student Book to page Lesson 72: Apply.



LESSON 72: APPLY

Directions: Double each number and then determine if the sum is even or odd.

Number	Double	Even or Odd?
1	1 + 1 = 2	Even
2		
3		
4		
5		
6		
7		
8		
9		
10		

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STUDENTS DO: Find page Lesson 72: Apply in the student book.

3. TEACHER SAY: On this page, you will see numbers 1 to 20. Work with your Shoulder Partner to double each number and then determine if the sum is even or odd. Complete as many as you can. You may test the sum using counters if you need to. Raise your hand if you would like counters to test for even and odd.

TEACHER DO: Hand out counters to students who request them.

STUDENTS DO: Work with **Shoulder Partner** to determine if the sum of even and odd doubles is even or odd. Use counters if needed.

TEACHER DO: As students work, walk around to observe who understands the concept of even and odd and who might need additional instruction. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Good work. Return your counters to the front and put away your pencil and student book.**



STUDENTS DO: Return counters and put away pencil and student book.

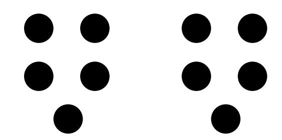


Reflect (5 minutes)

Directions

Note to the Teacher: During Reflect time, students consider why doubling any number always produces an even sum.

1. TEACHER DO: Draw the diagram below on the board.



TEACHER SAY: **Today we practiced doubling numbers. We doubled even and odd numbers and found that we always get an even sum, whether we double an even number or an odd number. Why do you think we always get an even sum when we double? Think for a minute, and then I will call on a few students to share their thinking with the group. Give me a Thumbs Up if you would like to share your thinking.**



STUDENTS DO: Think for a minute. Then give a **Thumbs Up** to volunteer. Selected students share their thinking

TEACHER DO: If no students discuss pairing the two leftover numbers from odd addends, briefly discuss your drawing.

Note to the Teacher: Students are not assessed on this concept (why doubling two odd numbers results in an even sum). However, it may be helpful for some students to see this pattern in a visual representation.

TEACHER SAY: **Take a look at the picture I drew on the board. How many dots are in each group?**



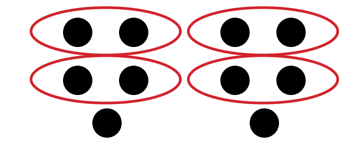
STUDENTS DO: Call out together: 5.

TEACHER SAY: **Is 5 an even number or an odd number?**



STUDENTS DO: Call out together: odd.

TEACHER DO: Draw lines or circles to partner the dots in the first set of 5, leaving one dot without a partner. Do the same for the second set of dots.



TEACHER SAY: **What do we get if we add 5 and 5 together?**

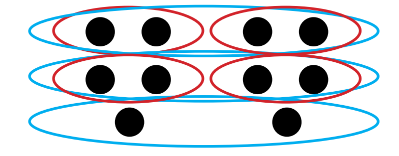


STUDENTS DO: Call out together: 10.

TEACHER SAY: **Is 10 an even number or an odd number?**

 **STUDENTS DO:** Call out together: even.

TEACHER DO: Draw lines to show how each pair of dots in the first 5 gets paired to another pair of dots in the second 5. Then show how the two leftover dots get paired with each other, forming an even set of pairs.



TEACHER SAY: **I enjoy hearing your mathematical thinking. Doubling a number makes sure that we have partners and nothing left over. I wonder what happens when we add an even and an odd number? We will investigate that in our next math lesson.**

Lesson 73 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Find the sum of two numbers.
- Determine whether adding an even and an odd number results in an even or odd sum.

KEY VOCABULARY

- Addition
- Even
- Odd
- Sum

MATERIALS

- Calendar Math area
- Class chart of sums
- Sets of number cards 1–10 (one set per pair of students)
- Sets of 20 counters (one set per pair of students)
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Draw on the board the chart shown in Chapter Preparation for the Teacher. (A version of this chart also appears in the Mathematics Student Book on the Apply page for this lesson.)

Print a set of 1–10 number cards for each pair of students. See the Number Cards 1–10 Blackline Master.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time like we did yesterday.

TEACHER DO: Ask two questions about the daily schedule, such as the following:
- At what time will we have break?
- What time does math start?
- When will the school day be over?
- When will we have writing/reading?
- Which clock shows something that starts at a quarter after? A quarter to? A half hour?

Ask different students, using **Calling Sticks** or having students raise hands to answer.



STUDENTS DO: Selected students answer questions about time, sharing verbally or by recording the time (as directed by the teacher).

Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students continue to explore the concept of even and odd numbers and investigate what happens when an odd and an even number are added together. They use number cards to create equations, find the sum, and then determine if the sum is even or odd.

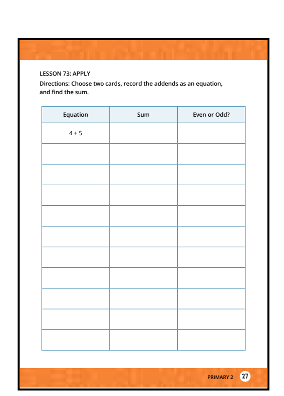
1. TEACHER SAY: **Raise your hand if you can tell us what we learned yesterday when we practiced doubling numbers.**

 STUDENTS DO: Raise a hand to volunteer. Selected students share their thinking.

TEACHER DO: Confirm accurate ideas and correct misconceptions. If no students mention that doubling even or odd numbers results in a sum that is even, review the concept using student helpers or by drawing on the board.

TEACHER SAY: **What do you think might happen if we add an even number and an odd number? Turn and Talk to your Shoulder Partner. Give me a Thumbs Up when you are ready to share your thinking.**

 STUDENTS DO: Turn and Talk to Shoulder Partner. Give a Thumbs up when ready to share. Selected students share their ideas.



LESSON 73: APPLY

Directions: Choose two cards, record the addends as an equation, and find the sum.

Equation	Sum	Even or Odd?
4 + 5		

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2. TEACHER SAY: **Good thinking. Today we are going to investigate to find out what happens. You will work with a partner. You will each pick a number card. Those number cards are your addends. You will find the sum of the two numbers and determine if that sum is even or odd. Take out your Mathematics Student Book and turn to page Lesson 73: Apply.**

 STUDENTS DO: Find page Lesson 73: Apply in the student book.

TEACHER SAY: **In your book, you can see a chart where you can record your equation, the sum, and whether the sum is even or odd. I made a version of this chart of the board. Let's do one together. I am going to pretend that I picked two cards – a 4 and a 5. 4 + 5 is written in your book. Find the sum of 4 and 5 and record your answer. Raise your hand when you are done.**

 STUDENTS DO: Add 4 and 5 and record the sum. Raise hand when done. Selected student shares their answer.

TEACHER SAY: **Yes, the sum of 4 and 5 is 9. Is 9 even or odd? Give me a Thumbs Up if you know.**

 STUDENTS DO: Give a Thumbs Up if they know. Selected students answer the question.

TEACHER DO: If necessary, model a strategy for determining whether the sum is even or odd. Write even or odd in the last column.

TEACHER SAY: **Good, 9 is an odd number. Write odd in the last column.**

 STUDENTS DO: Write odd in the last column.

3. TEACHER SAY: **Now it is your turn. Let's do Hands Up, Pair Up to get a partner. Once you have a partner, sit together and I will bring you number cards and counters. You will pick two cards to find your addends and record the equation and the sum. Then you can use the counters—if you need them—to determine if your sum is even or odd. Let's Hands Up, Pair Up. Take your book and pencil with you.**

 STUDENTS DO: Hands Up, Pair Up to find a partner. Move to sit with partner.

TEACHER DO: Hand out number cards and counters to each pair of students. Walk around and observe students as they work.

STUDENTS DO: Work with partner to pick cards, record equations and sums, and determine if sums are even or odd.

TEACHER DO: Walk around and observe students as they work. Take note of students who need additional support in identifying whether a number is even or odd. When Learn time is almost over, use an **Attention Getting Signal** to bring the group back together.

Note to the Teacher: As an extension activity for students who finish early, have them create a 2-digit addend and a 1-digit addend. This will enable students who are ready for a challenge to investigate even and odd number patterns past single digits.

To extend this learning experience using computational thinking, ask students to consider and discuss how they can use patterns they identify for even and odd numbers to make their work quicker and more efficient.

TEACHER SAY: Good job. Return to your seats and then circle all the sums that are odd.



STUDENTS DO: Return to seats and circle all the sums that are odd.

TEACHER SAY: Now that you have circled the sums that are odd, look at the two numbers that you added to get the odd sum. Turn and Talk to your Shoulder Partner about what you notice. Give me a Thumbs Up when you are ready to share. I will give you about one minute.



STUDENTS DO: Turn and Talk about the odd sums and any observations about the numbers that were added to create an odd sum. Give a **Thumbs Up** when ready. Selected students share their observations.

TEACHER SAY: Great observations. When we add an even and an odd number, the sum is odd. Help me finish these sentences.

TEACHER DO: Write on the board: even + even = _____; odd + odd = _____; and even + odd = _____.



STUDENTS DO: Help the teacher complete the sentences based on what they have learned about even, odd, and sums of even and odd numbers in the last few math lessons.

TEACHER SAY: Good investigating work today. Keep out your student book for Reflect.

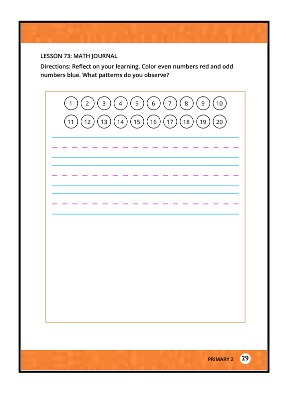


Reflect (5 minutes)

Directions

Note to the Teacher: Students have investigated what happens when they add two odd numbers, two even numbers, and an odd and even number. This exploration helps students build a deeper understanding of the number system. In future lessons, return to the concept of even and odd when solving 2- or 3-digit addition and subtraction problems. Challenge students to determine whether a sum is even or odd based on what they have learned about place value and number patterns. In Reflect today, students connect their understanding of even and odd numbers to a number chart and reflect on the patterns they observe.

Continue to encourage students to look for patterns in the numbers and operations they use in math. This practice will improve their familiarity and facility with numbers and build their confidence in making sense of new math skills and concepts. When children know how numbers relate to each other and how they behave in equations, they feel more confident about their abilities and more willing to take chances and share observations.



1. TEACHER SAY: Turn to page Lesson 73: Math Journal in your student book. Take out a red crayon and a blue crayon.



STUDENTS DO: Turn to page Lesson 73: Math Journal in the student book. Take out red and blue crayons.

TEACHER DO: Read the directions aloud to students. Direct students to begin working.

 **STUDENTS DO:** Follow the directions in their student book to complete the journal entry.

TEACHER DO: After about two minutes, ask students to describe the patterns they observe. Encourage students to extend their thinking to include potential applications of this information in identifying even and odd numbers.

 **STUDENTS DO:** Selected students share observations.

TEACHER SAY: **You made some interesting observations about even and odd number patterns. How does this information help you determine whether a number is even or odd without using counters? Turn and Talk to your Shoulder Partner and then give me a Thumbs Up when you are ready to share.**

 **STUDENTS DO:** **Turn and Talk** to a **Shoulder Partner** about their thinking. Give a **Thumbs Up** when ready. Selected students share ideas.

TEACHER SAY: **Great job today. Put away your materials.**

 **STUDENTS DO:** Put away materials.

Lesson 74 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Identify the rule for a number pattern.
- Extend a number pattern two places.

LESSON PREPARATION FOR THE TEACHER

Create a shape pattern poster. See Chapter Preparation for the Teacher for instructions.

KEY VOCABULARY

- Pattern
- Rule

MATERIALS

- Calendar Math area
- Shape pattern poster
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time like we did yesterday.

TEACHER DO: Ask two questions about the daily schedule, such as the following:
- At what time will we have break?
- What time does math start?
- When will the school day be over?
- When will we have writing/reading?
- Which clock shows something that starts at a quarter after? A quarter to? A half hour?

Ask different students, using **Calling Sticks** or having students raise hands to answer.



STUDENTS DO: Selected students answer questions about time, sharing verbally or by recording the time (as directed by the teacher).

Learn (40 minutes)

Directions

Note to the Teacher: The next four lessons focus on number patterns. Patterns are important in the development of algebraic thinking. Students analyze number patterns, state rules for patterns, continue patterns, and create their own patterns. They begin this exploration looking at shape patterns and then move into number patterns. In this first lesson, students continue a number pattern two places.

As students develop more confidence in identifying and extending number patterns, provide opportunities for them to identify and correct errors as well. This practice is an important computational thinking skill and builds students' comfort with risk-taking in mathematics.

1. TEACHER DO: Display the shape pattern poster.

TEACHER SAY: Over the past few days, we discovered that even numbers have a pattern that goes 2, 4, 6, 8, 0. We also discovered that the odd numbers have the pattern 1, 3, 5, 7, 9, and it repeats. Today we are going to look at some more patterns. On the board is a poster with two different patterns. Let's look at the first one. Turn and Talk to your Shoulder Partner about what you notice about this pattern. Give me a Thumbs Up to share what you noticed.



STUDENTS DO: Turn and Talk about the first pattern. Give a Thumbs Up to share. Selected students share their observations.

TEACHER DO: Repeat the process with the second pattern.

Note to the Teacher: If no student mentions the names of the shapes, prompt students to do so. This serves as a means of reviewing geometry and linking to number patterns.

TEACHER SAY: Good observations. Both of these patterns are shape patterns. Look at the first pattern. Lean and Whisper what shape would come next in the first pattern.



STUDENTS DO: Lean and Whisper answer.

TEACHER DO: Confirm correct responses.

TEACHER SAY: Look at the second pattern. Lean and Whisper what would come next in that pattern.



STUDENTS DO: Lean and Whisper answer.

TEACHER DO: Confirm correct responses.

TEACHER SAY: Good. We can see the shapes in these patterns and think about what the next shape will be based on what we notice. We could write a rule for this first pattern that would describe what was happening. For example, the rule for the first pattern would be: blue square, red circle, green triangle. What would the rule be for the second pattern? Lean and Whisper.



STUDENTS DO: Lean and Whisper answer.

TEACHER DO: Confirm correct responses.

2. TEACHER SAY: Good. Rules describe what is happening in the pattern. They help us to know how to continue the pattern. The same thing can be done with numbers. I am going to write some numbers on the board. See if you can determine which number would come next in the pattern.

TEACHER DO: On the board, write 0, 10, 20, 30, 40, ______, ______.

TEACHER SAY: Pop up if you think you might know what the next two numbers are in this pattern.

 STUDENTS DO: Pop up if they know the answer.

TEACHER SAY: **Lean and Whisper what the next two numbers would be.**

 STUDENTS DO: Lean and Whisper: 50, 60.

TEACHER SAY: **Yes, the next two numbers in this pattern would be 50 and 60. Raise your hand if you think you can explain the rule for this pattern.**

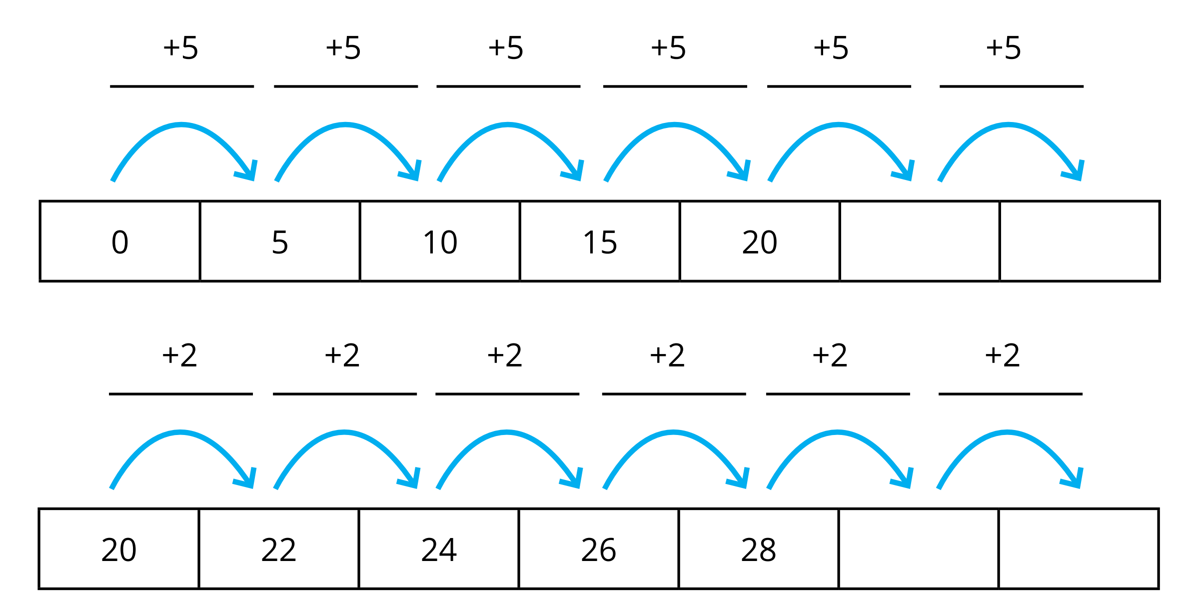
 STUDENTS DO: Raise hand to share. Selected students share their answers.

TEACHER SAY: **Yes, the rule for this pattern is skip counting by 10 or adding 10 each time. Remember, the rule tells us what to do to continue the pattern. Let's try a few more.**

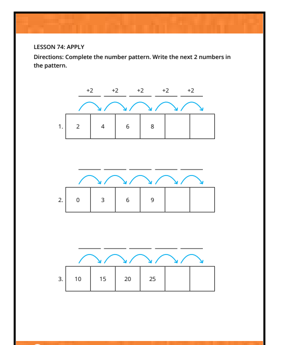
TEACHER DO: On the board, write the two patterns below. Have students raise hands to volunteer to write the next two numbers and describe the rule for each.

 STUDENTS DO: Raise hand to volunteer. Selected students continue the patterns and explain the rules.

TEACHER DO: Draw a diagram to help all students understand the patterns, as shown below. If some students continue to have trouble understanding, model the pattern using clapping or stomping. For example, in the second pattern, whisper 20 and then clap twice to 22. Then whisper 22 and clap twice to 24.



STUDENTS DO: Follow along with teacher.


LESSON 74: APPLY

Directions: Complete the number pattern. Write the next 2 numbers in the pattern.

1. 2, 4, 6, 8

2. 0, 3, 6, 9

3. 10, 15, 20, 25

30 PRIMARY 2

3. TEACHER SAY: **Both of these number patterns have a rule to describe them that helps us continue the pattern. Let's practice some more. Take out your Mathematics Student Book and turn to page Lesson 74: Apply.**

 STUDENTS DO: Take out Mathematics Student Book and turn to page Lesson 74: Apply.

TEACHER SAY: **On this page, you will see some number patterns. You will also see arrows drawn to help you think about what is happening from one number to the next. You can write in what is happening to help you continue the pattern like we did together. If you are stuck, you can try the clapping strategy.**

You will work independently to figure out each pattern, record the rule for each one, and write the next two numbers in the pattern. Let's get to work.

 STUDENTS DO: Work independently to complete the pattern activity.

TEACHER DO: Walk around the room and observe students as they work. Note students who may

need additional instruction or support. Offer support where necessary. When Learn time is over, use an **Attention Getting Signal**.

Note to the Teacher: As an extension activity, have students who finish early continue the patterns for up to five numbers.

TEACHER SAY: Good work today looking at patterns and continuing them. Keep out your student book for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students determined rules for number patterns and continued the patterns two places. During Reflect, they share work with a **Shoulder Partner** *and compare answers.*

1. **TEACHER SAY: Today you determined the rule for number patterns and continued them two places. Some of the patterns may have been easier for you than others. Turn and Talk to your Shoulder Partner and share your answers with each other. Discuss which patterns were easier for you and which ones were more challenging, especially if your answers do not match. If you and your partner have different ideas, see if you can figure out why. You have about 3 minutes.**

 **STUDENTS DO:** Share answers with a **Shoulder Partner**. Identify rules for patterns and discuss areas of disagreement. Correct errors.

TEACHER SAY: Great work today. Thank your Shoulder Partner for listening and put away your pencil and student book. We will look at more number patterns tomorrow.

 **STUDENTS DO:** Thank their **Shoulder Partner** and put away student book.

Lesson 75 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply a rule to create a number pattern up to five places. • Add or subtract to extend a pattern.	• Decreased • Increased • Pattern • Rule	• Calendar Math area • Pattern Rule Cards (one set per group of four students) • Strips of paper (about 10 per group of four students)

LESSON PREPARATION FOR THE TEACHER

Print out sets of Pattern Rule Cards (one set per group of four students). See the Pattern Rule Cards Blackline Master.

Cut strips of paper (about 5 cm x 15 cm) for pattern work (at least 10 strips per group of four students).



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time like we did yesterday.

TEACHER DO: Ask two questions about the daily schedule, such as the following:

- At what time will we have break?
- What time does math start?
- When will the school day be over?
- When will we have writing/reading?
- Which clock shows something that starts at a quarter after? A quarter to? A half hour?

Ask different students, using **Calling Sticks** or having students raise hands to answer.



STUDENTS DO: Selected students answer questions about time, sharing verbally or by recording the time (as directed by the teacher).

Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students analyze more complex patterns. They extend these new patterns five places. Then they work in groups of four to create patterns based on Pattern Rule Cards. Be sure to use a variety of strategies to model patterns, including clapping, drawing arrows, and using the 120 Chart. These strategies provide opportunities for all students to build and apply their understanding of patterns and pattern rules. To extend learning using computational thinking skills, have students model patterns in their own way and explain how the models help illustrate a pattern.

1. TEACHER DO: Write the following pattern on the board and draw arrows to record what is happening between each number.

70, 65, 60, 55, 50, ______, ______, ______, ______, ______

TEACHER SAY: Yesterday we looked at number patterns and identified the pattern and continued it based on a rule we discovered. Let's look at the pattern I just wrote on the board. Turn and Talk to your Shoulder Partner about what you notice. I will use Calling Sticks to choose some of you to share your thinking.



STUDENTS DO: Turn and Talk about the pattern on the board. Selected students share their thinking.

TEACHER DO: Record students' ideas on the board. Then, model clapping and counting to reinforce that the pattern is decreasing by 5.

TEACHER SAY: Nice observations. This pattern is not increasing, or getting larger, like the ones yesterday. The numbers are getting smaller, or decreasing. If I try the clapping strategy, I whisper 70 and then clap and count: (clap) **69,** (clap) **68,** (clap) **67,** (clap) **66,** (clap) **65. I clapped backward 5 numbers. So the rule would be "subtract 5." I can write the rule on the arrows above the pattern.**

TEACHER DO: Record the rule (– 5) on the arrows.

TEACHER SAY: Let's use this rule to help us fill in the next five blanks. When I point to the space, call out the number I should record. I will give you time to subtract 5.

TEACHER DO: Point to each blank and wait for students to state what number to write. Record the numbers to extend the pattern.



STUDENTS DO: When teacher points to blank, call out the number that belongs in the space using the rule. Students should respond: 45, 40, 35, 30, 25.

2. TEACHER SAY: Good job finding the missing numbers using the rule "subtract 5." Number patterns can increase or decrease. We can have rules where the numbers are adding a certain amount or subtracting a certain amount each time. Sometimes rules can include adding and subtracting.

Today we are going to create some patterns using Pattern Rule Cards. The card will tell us what number to start with and then tell us the rule. Remember, not all number patterns start at zero. I am going to bring you strips of paper. You and your Shoulder Partner will share it. We will record the patterns on strips of paper. Let's try one together.

TEACHER DO: Hand out strips of paper to **Shoulder Partners**.

TEACHER SAY: Our pattern rule is + 3. I will write that on the board. You write it on your strip of paper.

TEACHER DO: Write + 3 on the board.



STUDENTS DO: Write + 3 on their strip of paper.

TEACHER SAY: Our starting number is 40. So we need to start our pattern at 40. I will write that on the board too. That is the first number in our pattern. You write 40 on your strip and then 4 blank lines.

TEACHER DO: Write 40 on the board and then make four more lines: 40, _____, _____, ______, _____.

 **STUDENTS DO:** Write 40 on the strip of paper. Add 4 blank lines.

TEACHER SAY: Work with your Shoulder Partner to fill in the next four numbers in this pattern. When you are done, give me a Thumbs Up. I will choose a Shoulder Partner team to come up and complete the pattern.

 **STUDENTS DO:** Work with **Shoulder Partner** to fill in the next four numbers in the pattern. Give a **Thumbs Up** when done. Selected partners record their work on the board.

TEACHER DO: Confirm correct answers. Correct misconceptions. Review rule and how to extend pattern as needed.

TEACHER SAY: Now it is going to be your turn. You and your Shoulder Partner will find another Shoulder Partner pair. You will get one deck of Pattern Rule Cards. Each pair of Shoulder Partners will pick a card. Read the card and make the pattern with your Shoulder Partner on a strip of paper. When you are done, swap cards with the other pair. They will check your work. You will check their work. When both teams are finished, pick two more cards and start again. Raise your hand if you have any questions before we start.

 **STUDENTS DO:** Raise hand to ask any clarifying questions about the activity.

TEACHER SAY: Let's begin. Find another set of Shoulder Partners and sit together. Remember to write your pattern rule and the starting number on your strip of paper. Then extend the pattern to five places. An example is on the board.

 **STUDENTS DO: Shoulder Partners** find another pair to work with and sit together.

TEACHER DO: Hand out strips of paper and sets of Pattern Rule Cards to students. If there are not enough students for all **Shoulder Partners** to find another group, have some students work in pairs, where students make their own patterns based on a card and then swap to check each other's work.

 **STUDENTS DO:** Work to create and extend patterns and check each other's work.

TEACHER DO: Allow students to work for the remainder of the Learn segment. Observe students as they work to determine who is grasping the concept and who needs additional support. When Learn time is over, use an **Attention Getting Signal** to bring the group back together.

Note to the Teacher: If students are having difficulty starting a pattern at a number other than zero, alter the task to start at zero but continue following the rule that is stated.

TEACHER SAY: Nice work with patterns. Bring the cards back to me and return to your seat. For Reflect, lay out your pattern strips on your desk.

 **STUDENTS DO:** Return cards and go back to seats. Lay pattern strips on desk.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students do a **Gallery Walk** *to see each other's work.*

1. TEACHER SAY: **Today we are going to do a Gallery Walk for our Reflect time. We will walk around the room looking at our friends' patterns and rules. See if your friends did the same pattern as you. What patterns did they do that you did not? Did they do their patterns correctly? What else do you notice? Walk around for 1 minute quietly. When I clap three times, stop and return to your seat. Then we will share our observations.**

 **STUDENTS DO:** Walk around the classroom looking at other students' work. Stop walking when they hear the claps and return to seat.

TEACHER SAY: **Give me a Thumbs Up if you would like to share with the group what you noticed.**

 **STUDENTS DO:** Give a **Thumbs Up** to share. Selected students share observations.

TEACHER SAY: **Good job today reading a rule and creating a number pattern with five numbers that fit the rule. In our next math lesson, you will continue to look at number patterns and create some of your own. I will collect the pattern strips.**

TEACHER DO: Collect the pattern strips.

Lesson 76 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Match a rule to a number pattern. • Extend number patterns using a given rule. • Create a pattern rule and matching number pattern.	• Decreasing • Increasing • Rule	• Calendar Math area • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, instead of looking at the schedule and using the clocks, students practice writing analog and digital times for different events. Continue to have the clocks on the schedule as a visual reference for students.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the last five days, we looked at what time different parts of our day happen. For the next five days, we are going to think about some other times and write the time on analog and digital clocks. I will state an event and what time it might occur. I will use Calling Sticks to select a student to come up and draw the hands on the clock and record the digital time.

TEACHER DO: Think of an event that might occur during the day or the next couple of days. If a special event is happening that week, use that. Examples are shown below. Alternatively, have students volunteer events that might be happening along with the time they start.
- This morning I ate breakfast at 7:30 a.m.
- This weekend I am going to the movies at 5:15 p.m.
- There is a football game tonight at 4:30 p.m.
- I am going to dinner at 8:00 p.m.

Use **Calling Sticks** to choose students to come to the front and draw the hands on the analog clock as well as record the digital time. Do one or two events each day, depending on time.



STUDENTS DO: Selected students draw the hands on the analog clock and record the digital time.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students practice matching rules to various number patterns. This requires students to evaluate each pattern and determine the rule to create the match.

1. TEACHER SAY: Tell your Shoulder Partner two things you remember about number patterns. Give me a Thumbs Up when you are ready to share.



STUDENTS DO: Turn and tell **Shoulder Partner** two things about number patterns. Give a **Thumbs Up** when ready. Selected students share their thinking.

Note to the Teacher: Students should mention seeing if the numbers are increasing or decreasing, finding the rule, and adding or subtracting to the pattern. If these are not mentioned, share them with the students.

TEACHER SAY: Thank you for sharing.

2. TEACHER DO: Write the following patterns and rules on the board:

Rule: +4	59, 52, 45, 38, 31
Rule: +8	
Rule: –7	26, 30, 34, 38, 42
Rule: –3	

TEACHER SAY: Today we are going to play a matching game with number patterns. In order to solve the problems, you have to examine the number pattern. Is it increasing or decreasing? Is it addition or subtraction? How much do the numbers increase or decrease each time? Once you figure out the pattern, match the rule with the correct number pattern. Look at the patterns and rules I wrote on the board. How would you match them? Raise your hand when you have an idea.



STUDENTS DO: Examine each number pattern and match it to the correct rule. Raise their hand when they are ready. Selected students share their answers and draw lines from the rule to the correct number pattern.

Rule: +4	59, 52, 45, 38, 31
Rule: +8	
Rule: –7	26, 30, 34, 38, 42
Rule: –3	

3. TEACHER SAY: Now it is your turn. Turn to page Lesson 76: Apply in your Mathematics Student Book.



STUDENTS DO: Turn to page Lesson 76: Apply in Mathematics Student Book.

TEACHER SAY: You will work on your own to complete the practice. You will look at the numbers in each pattern and determine what is happening. You will draw a line to match each

pattern to its rule. Finally, you will use the rule to continue the pattern by writing the next five numbers in the blanks. You may begin.



STUDENTS DO: Examine the number patterns and match them to the correct rule. Continue each pattern by writing the next five numbers.

TEACHER DO: Walk around the classroom and take note of struggling students who may need more instruction on number patterns.

Note to the Teacher: As an extension activity, have students who finish early create their own number pattern match game.

TEACHER SAY: **Let's compare our answers with our Shoulder Partners.**



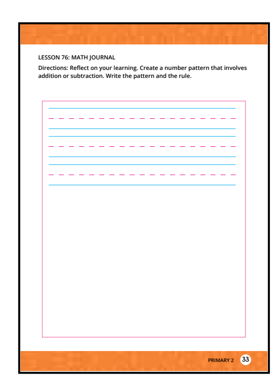
STUDENTS DO: Compare their work with their **Shoulder Partner**. If their answers are different, work out the problem together to find the correct answers.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on the skills they practiced today by thinking of number patterns in another way using either addition or subtraction as the rule.



LESSON 76: MATH JOURNAL

Directions: Reflect on your learning. Create a number pattern that involves addition or subtraction. Write the pattern and the rule.

PRIMARY 2 33

1. TEACHER SAY: **Today we explored several different number patterns. Each of these patterns had us add or subtract to make the pattern. Turn to page Lesson 76: Math Journal in your student book. Think about what you have learned about patterns. Then make your own rule involving addition or subtraction, choose a starting number, and create a number pattern that is at least five numbers long.**



STUDENTS DO: Reflect on learning. Make a pattern rule, select a starting number, and create a number pattern to at least five places.

TEACHER DO: Select a few students to share their patterns, if time allows.



STUDENTS DO: Selected students share work at the board.

Lesson 77 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Identify the rule in a number pattern. • Create addition and subtraction pattern rules. • Extend number patterns to five places using a given rule.	• Decreasing • Increasing • Pattern • Rule	• Calendar Math area • Number Pattern Caterpillar handout • Scissors • Crayons • Glue or glue sticks • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Print Number Pattern Caterpillar handout (one copy per student).

Create a completed model of the Number Pattern Caterpillar craft to show students. See Chapter Preparation for the Teacher.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: **Let's look at the clocks on our schedule and practice telling time.**

TEACHER DO: Repeat procedure from Lesson 76, asking different questions about time. Select students to write analog and digital times on the board.



STUDENTS DO: Selected students draw the hands on the analog clock and record the digital time.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students use their knowledge of patterns to create their own. To do so, they choose their own rule and starting number. The complexity of their patterns will depend on their current counting ability and understanding of pattern rules. Students create a Number Pattern Caterpillar based on their creations.

1. TEACHER DO: Write the following number pattern on the board:

34, 38, 36, 40, 38

TEACHER SAY: We have been working on patterns where we either add or subtract. Look at the pattern on the board. What is the rule? Is it addition? Is it subtraction? How do you know? Turn and Talk to your Shoulder Partner.



STUDENTS DO: Discuss the number pattern with their **Shoulder Partner**. Selected students share their thinking with the class.

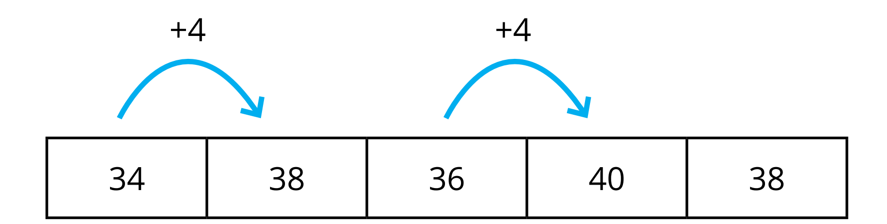
TEACHER SAY: Yes. The pattern increases and decreases. When it increases, we are adding. When it decreases, we are subtracting. How much does it increase each time? Raise your hand when you know.



STUDENTS DO: Look at the pattern. Raise hand to volunteer. Selected students share their thinking.

TEACHER SAY: When the numbers increase, they increase by 4 each time. So the addition rule is +4.

TEACHER DO: Draw arrows and write + 4 between each increasing number in the pattern.

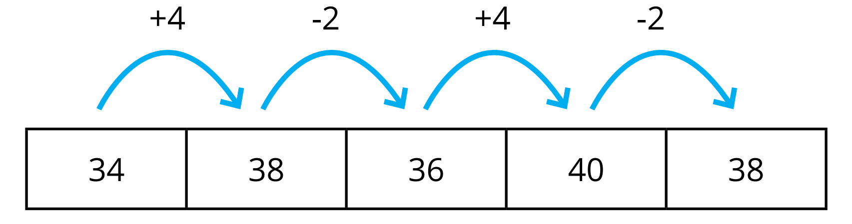


TEACHER SAY: How much does the pattern decrease when the numbers go down? Raise your hand when you know.



STUDENTS DO: Look at the pattern. Raise hand to volunteer. Selected students share their thinking.

TEACHER DO: Draw arrows and write –2 between each decreasing number in the pattern.

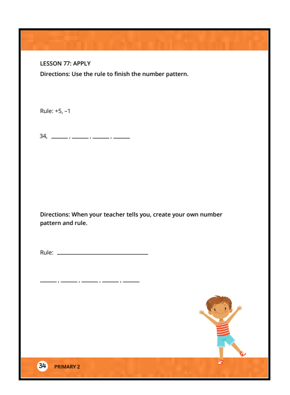


TEACHER SAY: The rule is +4, –2. Now we know patterns can have more than one rule. Open your Mathematics Student Book to page Lesson 77: Apply.



STUDENTS DO: Find page Lesson 77: Apply in the student book.

TEACHER SAY: Create a number pattern using the rule +5, –1 starting at the number 34. Remember, that means you add 5 to the first number to get the second number, subtract 1



LESSON 77: APPLY

Directions: Use the rule to finish the number pattern.

Rule: +5, -1

34, ___, ___, ___, ___

Directions: When your teacher tells you, create your own number pattern and rule.

Rule: ___

___, ___, ___, ___, ___

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from the second number to get the third number, add 5 to the third number to get the fourth number, and subtract 1 from the fourth number to get the fifth number. Write your pattern at the top of the page. When you are finished, compare your work with your Shoulder Partner's work.

 **STUDENTS DO:** Apply the rule to complete the number pattern to five places. When finished, compare their number pattern with their **Shoulder Partner's**.

TEACHER DO: Use **Calling Sticks** to select a student to share their work at the board. Encourage student to share their thinking.

 **STUDENTS DO:** Selected student shows work at the board and explains their thinking.

TEACHER SAY: Great work. Sometimes, number patterns have a rule that requires us to add and subtract in the same pattern just like this. Now let's create our own number patterns and rules. You will design your own pattern rule first. Your rule may include adding, subtracting, or both. Then decide on a starting number. Finally, complete your number pattern with your rule to five places. Be sure to write your rule and your number pattern in your student book.

 **STUDENTS DO:** Work independently to practice creating pattern rules and patterns.

TEACHER DO: Walk around the room and observe students as they work. Identify which students are ready for a challenge and which may need additional instruction and support.

2. TEACHER SAY: We all have come up with a different number pattern and rule. I saw some very exciting work. Now you will show your work on a Number Pattern Caterpillar.

TEACHER DO: Give each student a Number Pattern Caterpillar handout. Hand out (or have students take out) crayons, scissors, and glue. Hang your completed caterpillar model on the board for students to view. Point to each part of the caterpillar as you discuss the directions.

TEACHER SAY: First, you will cut out your caterpillar pieces. Then you will write your rule on the caterpillar's face. Next, you will write one number from your pattern on each body circle. Color your caterpillar and glue it together. Be sure you glue the body pieces in the right order or your pattern will not be correct. Write your name on the back of your completed caterpillar.

TEACHER DO: If needed, write the steps on the board.

 **STUDENTS DO:** Create their Number Pattern Caterpillars.

TEACHER DO: Observe students as they work to make sure they are creating accurate patterns and following directions. Offer assistance as needed.

Note to the Teacher: Hang caterpillars in the classroom or hallway for students to view. If students finish early, encourage them to create more rules and number patterns in their student books.



Reflect (5 minutes)

Directions

Note to the Teacher: For today's Reflect segment, students participate in a **Gallery Walk** *to observe other students' number patterns. Have students display their caterpillars at their tables if you have not yet had a chance to hang them.*

1. **TEACHER SAY: I am so excited to see each of your Number Pattern Caterpillars. Let's do a Gallery Walk to see each other's creations. Look at the rule and see if you can follow the pattern. Is it addition, subtraction, or both? Let's explore them.**



STUDENTS DO: Participate in the **Gallery Walk** to examine their friends' Number Pattern Caterpillars.

Note to the Teacher: You may choose to set a 30-second timer for students to have time to explore the pattern before they move to the next. They will not get to see all of them in the **Gallery Walk***, but will be able to view them when they are displayed in the classroom or hallway.*

TEACHER SAY: Thank you for being so creative with your number patterns and caterpillars. You may put away your student book and materials.



STUDENTS DO: Put away student book and materials.

TEACHER DO: Collect the caterpillar crafts to dry and display.

Lesson 78 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Define array.
- Identify arrays and non-arrays.
- Create an array.

LESSON PREPARATION FOR THE TEACHER

Create posters showing arrays and non-arrays. See Chapter Preparation for the Teacher for details.

Pre-cut 12 squares for each student. See Chapter Preparation for the Teacher for details.

KEY VOCABULARY

- Array
- Column
- Row

MATERIALS

- Calendar Math area
- Posters of arrays and non-arrays
- Sets of pre-cut squares (one set per student)
- Glue or glue sticks
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time.

TEACHER DO: Repeat procedure from Lesson 76, asking different questions about time. Select students to write analog and digital times on the board.



STUDENTS DO: Selected students draw the hands on the analog clock and record the digital time.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students make connections between patterns and arrays. To begin, you lead a concept attainment lesson where you show students examples of arrays and non-arrays and allow them to build an understanding that arrays contain rows and columns with no gaps. Students then explore building arrays using paper squares.

This activity provides an opportunity for students to apply computational thinking skills as they connect learning about patterns in numbers and shapes to patterns in operations, such as repeated addition and multiplication. They have moved from familiar concepts, such as simple number and shape patterns, to more abstract applications using concrete objects they manipulate. Take advantage of every opportunity in the next few lessons (and beyond) to help students make connections between patterns, arrays, and operations as they move through each lesson. Ask questions and allow students to share both observations and questions.

1. TEACHER SAY: **We have been learning about different patterns in math. Today I have a new kind of pattern to share with you. It is called an ARRAY. Say that with me.**

 STUDENTS DO: Say: array.

TEACHER SAY: **I am going to show you two pictures. One is an array and one is not. Look at both pictures and then you talk with your Shoulder Partner about what you notice.**

TEACHER DO: Show one example of an array and one example of a non-array.

 STUDENTS DO: Talk to their **Shoulder Partner** about what they notice.

TEACHER DO: After one minute of partner talk, use an **Attention Getting Signal** and ask a few students to share their ideas.

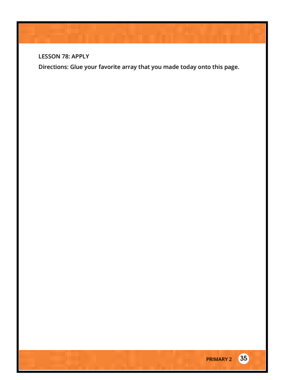
TEACHER SAY: **You noticed a lot. Both pictures have Xs, and they both have 4 in the top row. But only one of the pictures has objects arranged in rows and columns with no gaps. That one is the ARRAY. The other is just a picture. It almost has complete rows and columns but there are missing Xs. Let's look at more pictures. If you think the picture shows an array, stand up. If you think the picture does not show an array, squat down.**

TEACHER DO: Show the array/non-array posters. For each array poster, ask what makes it an array. For each non-array poster, ask how it could be made an array.

 STUDENTS DO: Stand if they think the drawing is an array. Squat if they think it is not an array. Answer questions about each picture.

2. TEACHER SAY: **Now you will practice building arrays. I will give you a set of paper squares. You may draw pictures or write numbers on your squares. Then arrange your squares into an array. Remember that arrays have rows and columns with no gaps. Your array can be horizontal or vertical. Try different things. Have fun.**

TEACHER DO: Hand out sets of squares to each student. Observe students as they work. After approximately 10 minutes, use an **Attention Getting Signal**.


LESSON 78: APPLY

Directions: Glue your favorite array that you made today onto this page.

PRIMARY 2 35

3. TEACHER SAY: **Open your Mathematics Student Book to page Lesson 78: Apply.**

 STUDENTS DO: Turn to page Lesson 78: Apply in the student book.

TEACHER SAY: **Glue your favorite array that you made today onto this page.**

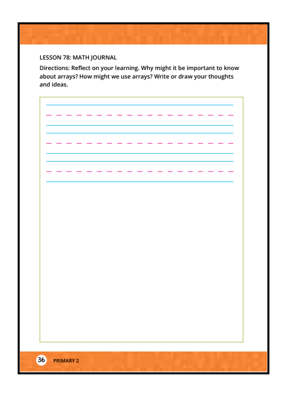
 STUDENTS DO: Glue favorite array into the student book.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students reflect on arrays and consider why they may be important. They record ideas in the Mathematics Student Book.



LESSON 78: MATH JOURNAL

Directions: Reflect on your learning. Why might it be important to know about arrays? How might we use arrays? Write or draw your thoughts and ideas.

36 PRIMARY 2

1. **TEACHER SAY: Turn to page Lesson 78: Math Journal in your student book.**

 **STUDENTS DO:** Turn to page Lesson 78: Math Journal in the student book.

TEACHER SAY: Today we learned about arrays. Why might it be important to know about arrays? How might we use arrays? Write or draw your thoughts on your Math Journal page.

 **STUDENTS DO:** Reflect on arrays and record thoughts.

TEACHER DO: Observe students as they write journal entries. At the end of Reflect, have students put away materials.

Lesson 79 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use repeated addition to find the total number of objects in arrays. • Write addition equations to express the total number of objects in an array.	• Array • Column • Horizontal • Repeated addition • Row • Vertical	• Calendar Math area • Ten frame • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create or print a blank ten frame to model an array for students.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time.

TEACHER DO: Repeat procedure from Lesson 76, asking different questions about time. Select students to write analog and digital times on the board.



STUDENTS DO: Selected students draw the hands on the analog clock and record the digital time.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students make connections between repeated addition and arrays. Students examine arrays and use addition to find the total number of objects in an array. They also write equations for arrays using repeated addition.

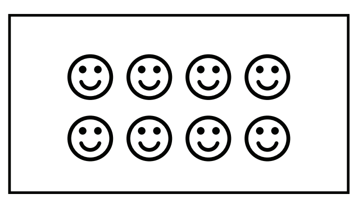
1. TEACHER SAY: **Turn to your Shoulder Partner and tell them everything you remember about arrays.**

 STUDENTS DO: Discuss everything they remember about arrays with their **Shoulder Partner**.

TEACHER DO: Use **Calling Sticks** to select a few students to share.

 STUDENTS DO: Selected students share their thoughts.

TEACHER DO: Draw the following array on the board:



TEACHER SAY: **This is an example of an array. How many smiley faces do I have all together? Show me on your hands.**

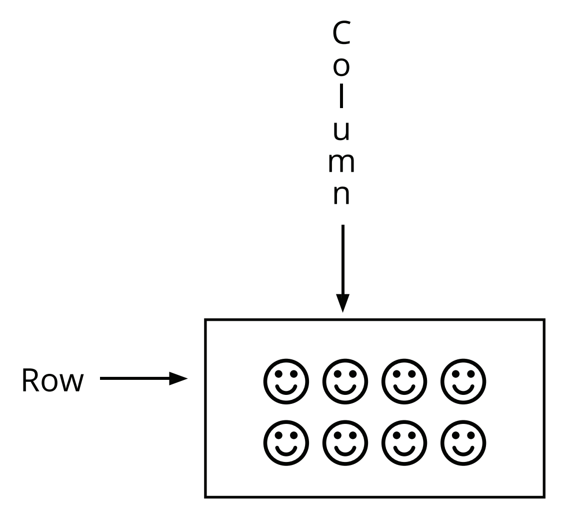
 STUDENTS DO: Show 8 on their fingers.

TEACHER SAY: **Yes. We have 8 altogether. When you added them, did you count each one?**

 STUDENTS DO: Respond briefly to the teacher's question.

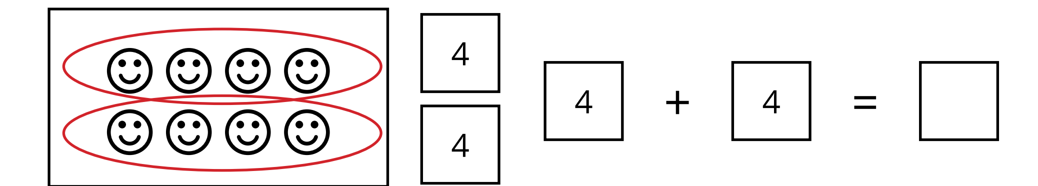
TEACHER SAY: **That is one way to find the total. There is another way—repeated addition. We can use arrays to show repeated addition. Remember, when we repeat something, it means we do it more than once. So repeated addition means that you are adding a number more than once. Let me show you how to use repeated addition to find out how many faces are in this array more quickly.**

2. TEACHER DO: Write "column" and "row" on the board as shown.



TEACHER SAY: **Remember we have COLUMNS that are horizontal, or go across from right to left. We also have COLUMNS that are vertical and go up and down. Let's count using our rows first.**

TEACHER DO: Draw and count as you explain.



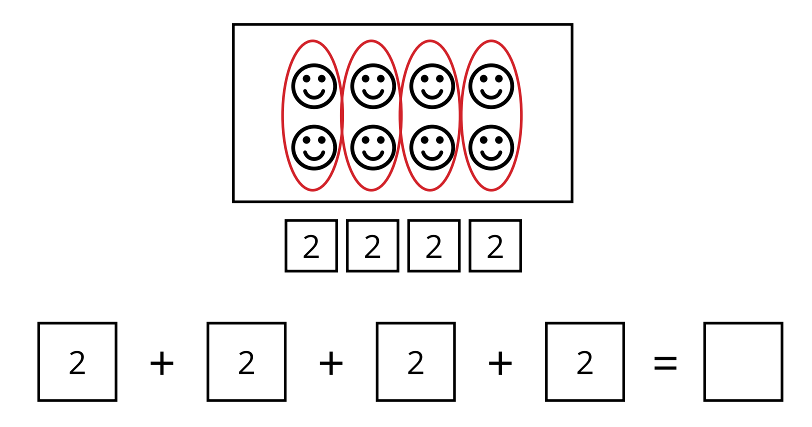
TEACHER SAY: We have one row with 4 faces. We have a second row with 4 faces. What is 4 + 4?



STUDENTS DO: Say: 8.

TEACHER SAY: That is repeated addition. Instead of counting the faces one at a time, we added 4 faces two times to solve how many faces were in the array. There is another way we can solve this. We can count using the columns.

TEACHER DO: Draw and count as you explain.



TEACHER SAY: We have 4 columns with 2 faces in each, so we can count 2 four times. What is 2 + 2 + 2 + 2? Show me on your fingers.



STUDENTS DO: Show 8 on their fingers.

TEACHER SAY: Yes. Turn to your Shoulder Partner and explain to each other why this is repeated addition.

STUDENTS DO: Turn and explain to a **Shoulder Partner** why 2 + 2 + 2 + 2 = 8 is repeated addition.

TEACHER SAY: Yes, we added 2 repeatedly.

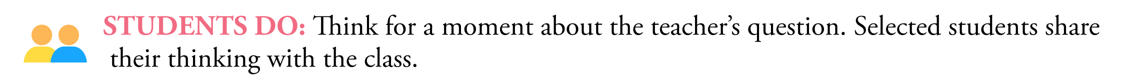
3. TEACHER DO: Display a blank ten frame on the board.

TEACHER SAY: What is this?



STUDENTS DO: Say: ten frame.

TEACHER SAY: Yes, it is a ten frame. But it is also an array. Think for a moment. What makes this ten frame an array? I will use Calling Sticks to select some of you to share your thinking.



STUDENTS DO: Think for a moment about the teacher's question. Selected students share their thinking with the class.

TEACHER SAY: It is an array because it is a group of objects arranged in rows and columns.

4. TEACHER SAY: Open your Mathematics Student Book to page Lesson 79: Apply.



STUDENTS DO: Find page Lesson 79: Apply in the student book.

TEACHER SAY: **We are going to practice writing repeated addition equations to solve how many objects are in each array. Notice that the first array is a ten frame. There are 2 rows, so 2 is written after rows. There are 5 columns, so 5 is written after columns. We can create a repeated addition equation by adding the rows or by adding the columns. If I add the columns, I can write 2 + 2 + 2 + 2 + 2 = 10. If I add the rows, I can write 5 + 5 = 10. Both answers are correct. Raise your hand if you have questions about the directions.**

 **STUDENTS DO:** Raise hand to ask questions, if necessary.

TEACHER DO: Clarify directions as needed.

TEACHER SAY: **You may begin. Work on your own.**

 **STUDENTS DO:** Work independently to complete the array practice in their student book.

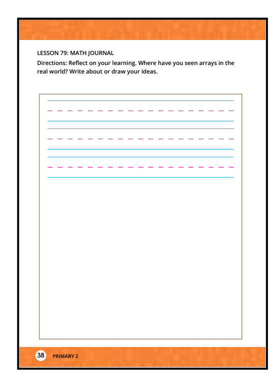
TEACHER DO: Circulate around the room and offer help as needed.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect by making a real-world connection to arrays in the classroom, at home, and around the city.



LESSON 79: MATH JOURNAL

Directions: Reflect on your learning. Where have you seen arrays in the real world? Write about or draw your ideas.

38 PRIMARY 2

1. **TEACHER SAY:** **Arrays are not just in math. Arrays are everywhere in the world, but where? Take some time to reflect on arrays. Think about what they look like and where you have seen arrays in the real world. Turn to page Lesson 79: Math Journal in your student book and draw or write about your thinking.**

 **STUDENTS DO:** Reflect on where they have seen arrays in the real world. Draw or write about their thinking.

TEACHER DO: If time allows, have a few students share ideas.

 **STUDENTS DO:** Selected students share real-world experiences with arrays.

TEACHER SAY: **You may put away your student books.**

 **STUDENTS DO:** Put away student books.

Lesson 80 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Write addition equations to express the total number of objects in an array. • Design an array using repeated addition.	• Array • Column • Repeated addition • Row	• Calendar Math area • Assorted colors of construction paper • Scissors • Glue • Optional: Black markers (one per student) • Completed array building example • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather assorted colors of construction paper for students. See Chapter Preparation for the Teacher for additional details.

Create a completed example of an array building to show students. See Chapter Preparation for the Teacher for additional details.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at the clocks on our schedule and practice telling time.

TEACHER DO: Repeat procedure from Lesson 76, asking different questions about time. Select students to write analog and digital times on the board.



STUDENTS DO: Selected students draw the hands on the analog clock and record the digital time.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students review arrays as models for repeated addition. Then each student designs a building with an array of windows. The students put all of their buildings together to create an Array City for display in the classroom or hallway. This activity helps students build connections to real-world applications of arrays.

1. **TEACHER SAY: Yesterday we talked about arrays. At the end of the lesson, I asked you to think of arrays you have seen in the real world. If you have thought of another real-world array, pop up now.**

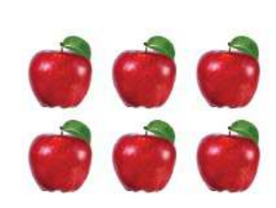
 **STUDENTS DO:** Pop up to share a real-world array. Selected students share their thinking.

TEACHER SAY: Open your Mathematics Student Book to page Lesson 80: Apply.

 **STUDENTS DO:** Turn to page Lesson 80: Apply in the student book.

TEACHER SAY: Let's look at the array that is at the top of the page.

TEACHER DO: Draw the array on the board to model.



Rows: ________

Columns: ________

________________ = ________

________________ = ________

This is a ________ by ________ array.

TEACHER SAY: Solve this array by writing the number of rows and columns and the repeated addition equations in your student book. Write one equation for the rows and another for the columns. Leave the last part blank.

 **STUDENTS DO:** Solve the array and write the number of rows and columns and the repeated addition equations in the student book.

TEACHER DO: Select a student who finished quickly to show their work on the board.

 **STUDENTS DO:** Selected student shows their work on the board.

TEACHER SAY: You should have all of the information filled in for the array except for the blank by blank part. There is another way we can name this array. All you do is say the number of rows BY the number of columns. For example, this apple array could be called a 2 by 3 array. This array has 2 rows with 3 apples in each row.

TEACHER DO: Point to the rows and columns. Count them aloud to help students make the connection between the picture and the description.

2. **TEACHER SAY: Below the 2 by 3 array, you will see another problem for you to complete. You will work on your own and with a partner. First, you will draw your own array on the page. When you are finished drawing your array, you and your partner will trade books. You will fill in the information box for your partner's array. They will fill in the information box for yours.**

If your partner did not draw an array, help them find and correct their error. Let's find our partners using Hands Up, Pair Up. Take your student book and pencil with you.



STUDENTS DO: Find a partner using **Hands Up, Pair Up**. Take their student book and pencil with them.

TEACHER SAY: **You may begin.**



STUDENTS DO: Draw an array in their book. Trade books with their partner to fill in the information box about their array.

TEACHER DO: Help students as needed. When done, have students return to their seats.



STUDENTS DO: Return to their seats with their student books.

3. TEACHER SAY: **Great work. Now we are going to do a fun art project with arrays. We are going to create an Array City. One place we often see arrays in the real world is in buildings. Windows on the different floors of the building are arranged in rows and columns. These are arrays. You will each design a building with an array of windows on it.**

TEACHER DO: Hand out construction paper (several different colors per table), scissors, and glue.

TEACHER SAY: **Draw a rectangle building on your construction paper and cut it out. Then you will add windows to the building to create your array. You get to decide how many rows and columns of windows your building will have. Remember to put your windows in rows and columns. On the back of your building, write your name, both repeated addition equations, and the description of your array: _____ by _____.**

TEACHER DO: Show students your example of a completed array building.

TEACHER SAY: **When we are all finished, we will put our buildings together to create a city. You may begin designing your building.**

STUDENTS DO: Design and create a building with an array of windows. On the back of their building, write their name, both repeated addition equations, and the description of their array: _____ by _____.

TEACHER DO: Walk around to observe students as they work. Offer help as needed.

Note to the Teacher: Give students at least 20 minutes to create their building. Periodically let them know how much time is left so they are able to manage their time correctly.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students help you assemble the class Array City. Students reflect on the variety of buildings and arrays in the Array City to strengthen their understanding of different types of arrays and their presence in the real world.

1. TEACHER DO: Decide how and where students will create and display their Array City. For example, students may glue their buildings to a large sheet of paper or place them face down and tape them together to form a collage.

TEACHER SAY: **Today you each designed a building where the windows of the building created an array. For Reflect, you will help me put our buildings together to create our very own Array City. When I call your table, bring your buildings and we will add them to the city.**



STUDENTS DO: When their table is called, take their buildings to the teacher and help create the Array City.

TEACHER SAY: **Wonderful job today class. I am so happy with the Array City we built as a class. I cannot wait to show others.**

PRIMARY 2

Mathematics

HOW THE WORLD WORKS

Chapter 3

Lessons 81 to 90

Lessons 81 to 90

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 81 to 90, students will work toward the following learning indicators:

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.d. Add 1-, 2-, and 3-digit numbers to 3-digit numbers using a variety of strategies including regrouping.
2.e. Explain why it is sometimes necessary to regroup tens or hundreds to solve problems.
2.f. Use estimation strategies in problem solving, such as mentally adding and subtracting 10 or 100 (within 1000).
2.g. Explain why addition and subtraction strategies work, using place value and the properties of operations.

Computational Thinking

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.d. Add and subtract 1-, 2- and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.
2.g. Explain why addition and subtraction strategies work, using place value and the properties of operations.

CH 3 Pacing Guide

LESSON	INSTRUCTIONAL FOCUS
81	Students will: • Participate in Calendar Math activities. • Apply strategies to estimate quantities. • Apply strategies to estimate sums and differences.
82	Students will: • Participate in Calendar Math activities. • Round 2-digit numbers to the nearest Ten. • Round two 2-digit numbers to estimate their sum.
83	Students will: • Participate in Calendar Math activities. • Apply estimation strategies in problem-solving situations. • Estimate sums and differences. • Round 3-digit numbers to the nearest Hundred.
84	Students will: • Participate in Calendar Math activities. • Add 2-digit numbers with regrouping. • Explain why it is sometimes necessary to regroup to solve problems.
85	Students will: • Participate in Calendar Math activities. • Use place value models to regroup and add. • Add two 2-digit numbers with regrouping.
86	Students will: • Participate in Calendar Math activities. • Use place value models to regroup and add. • Add two 3-digit numbers with regrouping.
87	Students will: • Participate in Calendar Math activities. • Add two 2-digit numbers with regrouping. • Apply mental math strategies to solve an addition problem involving regrouping.
88	Students will: • Participate in Calendar Math activities. • Add 1-, 2-, and 3-digit numbers with and without regrouping. • Use place value models to regroup and add. • Check answers to identify errors and misconceptions.
89	Students will: • Participate in Calendar Math activities. • Add 2- and 3-digit numbers with regrouping. • Make connections between concrete and abstract models of regrouping.

LESSON	INSTRUCTIONAL FOCUS
90	Students will: • Participate in Calendar Math activities. • Identify and correct errors in estimation and regrouping problems. • Add 1-, 2-, and 3-digit numbers with and without regrouping.

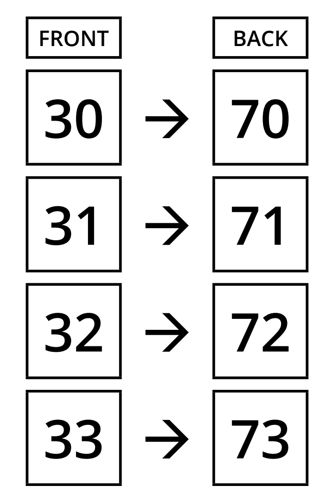
Chapter Preparation for Teacher

For Lesson 81:

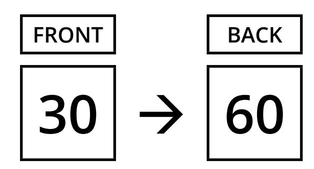
- Fill a clear jar with 31 to 75 (but not 40, 50, 60, or 70) small objects, such as marbles, rocks, or pieces of candy. Students will estimate the quantity of the objects.
- Print sets of Number Cards 0–9 (one set per pair of students). See Number Cards 0–9 Blackline Master.

For Lesson 82:

- Make a set of cards: The cards in this set (Set 1) should show numbers 30 through 40 on the front and 70 through 80 on the back.
  - The cards should be at least 15 cm x 20 cm.
  - Write the numbers large enough for students to see at their seats.
  - On the back of the card that says 30, write 70. On the back of the card that says 31, write 71. Continue in this way until you have written 80 on the back of the card that says 40. An example is shown below.



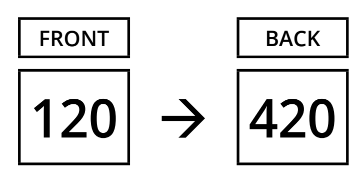
- Make a second set of cards: The cards in this set (Set 2) should show numbers 20 through 30 on the front and 50 through 60 on the back.
  - The cards should be at least 15 cm x 20 cm.
  - Write the numbers large enough for students to see at their seats.
  - On the back of the card that says 20, write 50. On the back of the card that says 21, write 51. Continue in this way until you have written 60 on the back of the card that says 30.



For Lesson 83:

- Make a set of cards: The cards in this set should show numbers 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, and 200 on the front and 410, 420, 430, 440, 450, 460, 470, 480, 490, and 500 on the back.
  - The cards should be at least 15 cm x 20 cm.
  - Write the numbers large enough for students to see at their seats.

    - On the back of the card that says 100, write 400. On the back of the card that says 110, write 410. Continue in this way until you have written 500 on the back of the card that says 200. An example is shown below.



- Print sets of Estimating Sums and Differences Cards for students (one set per small group of students. See the Estimating Sums and Differences Cards Blackline Master.
- Consider creating the student groups in advance so Learn time is used efficiently. Make a list of students and divide them into groups of four or five.

For Lesson 84:
- Make a large Tens–Ones place value mat to use for modeling.
- Create sets of straws (or other materials that can be bundled) as follows:
    - Each set should have 20 bundles of 10 straws and 20 loose straws. You will need a rubber band for each bundle.
    - If you use straws, consider cutting them in half to make it easier for students to lay them on their student book (and to decrease the total number of straws you need).
    - Place the straws into bags for easy distribution and collection.
    - You need one set for each small group of students.
    - Note: You can use Base Ten blocks if they are available, but the physical act of bundling a Ten helps students conceptualize and experience the abstract process of regrouping.

For Lesson 85:
- Gather/identify 3 objects, one that should be measured in centimeters, one that should be measured in meters, and one that should be measured in grams. For example, a pencil, the chalkboard, and a handful of raisins or paper clips.

For Lesson 86:
- Gather/identify 3 objects that can be measured in grams or kilograms (have at least one of each). For example, a pencil, a large book, and a handful of raisins or paper clips.

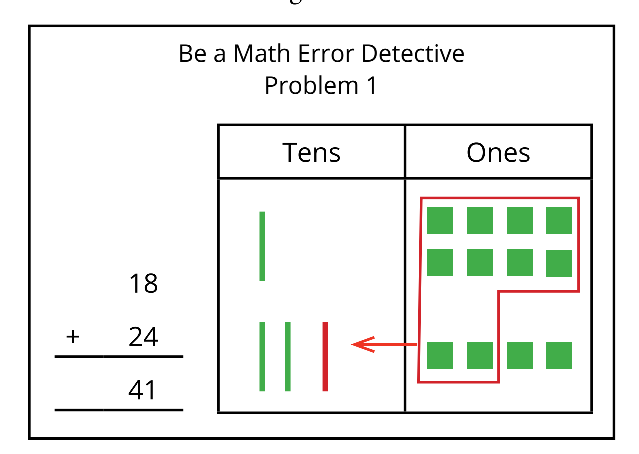
For Lesson 87:
- Gather/identify 3 objects that can be measured in grams or kilograms (have at least one of each).

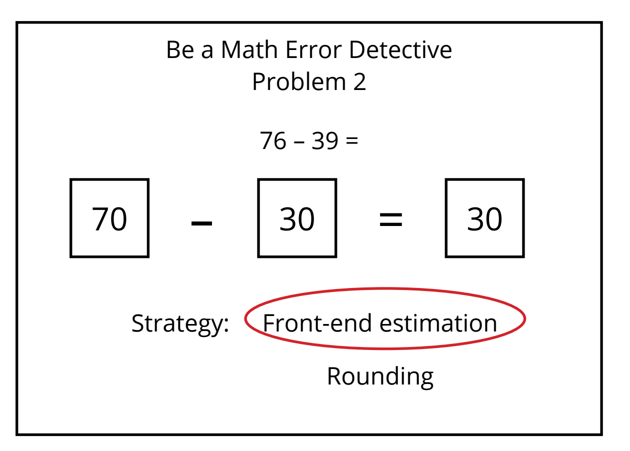
For Lesson 88:
- Gather/identify 3 objects that can be measured in grams or kilograms (have at least one of each).

For Lesson 89:
- Gather/identify 3 objects that measure more or less than 1 kilogram. Students will estimate their relative masses and explain their thinking.
- Create and display a large Hundreds–Tens–Ones place value mat.

For Lesson 90:

- Create three large posters showing "student" work to look like the posters shown below. Note that the answers shown for two of the problems are intentionally incorrect. Students will be finding the errors to correct .



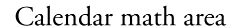


Be a Math Error Detective
Problem 3

Round 283 to the nearest hundred.

Answer: 300

Materials Used

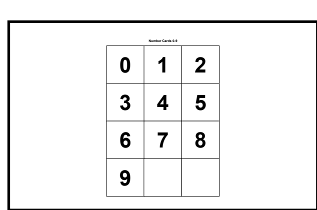

Calendar math area



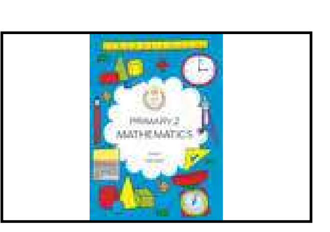
Jar



Number cards



Student book



Pencil



Straws



Tape



Place value mat

Estimating sums and difference cards

3 Digit number cards

Measurement review

Lesson 81 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply strategies to estimate quantities. • Apply strategies to estimate sums and differences.	• Difference • Estimate • Front-end estimation • Place value • Sum	• Calendar Math area • Jar filled with 31 to 75 small objects • Number Cards 0–9 (one set per pair of students) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Fill a clear jar with 31 to 75 small objects, such as marbles, rocks, or pieces of candy. See Chapter Preparation for the Teacher for additional details.

Print sets of Number Cards 0–9 (one set per pair of students). See Number Cards 0–9 Blackline Master.



Calendar Math (15 minutes)

Directions

Note to the Teacher: At the end of Calendar Math, students review previously learned measurement concepts. Students review length in Lessons 81 to 85 and mass in Lessons 86 to 90. Begin the length review with objects that are less than one-centimeter-ruler long. Over the next four days, use some objects that are more than one-centimeter-ruler long so that students can practice using the meter stick or more than one centimeter ruler.

Remember that this additional aspect of Calendar Math should take only a few minutes. It is intended as a quick review to help students retain skills and concepts.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the last 10 lessons, we looked at our schedule, practiced telling time, and thought about what time certain events might happen in our day. For the next 10 lessons, we are going to review what we have learned about measurement.

TEACHER DO: Find two objects in the classroom that are different lengths. There should be a visible difference between the two objects. Bring them to the front of the class. Alternatively, you could draw two different length lines on the board if you do not want to use real objects or alternate drawing lines so that you have a specific length to work with and then use objects on other days.

TEACHER SAY: I have two objects here (or two lines drawn on the board). Let's measure their lengths and compare. Do you remember our body benchmarks? A centimeter is about the length across your pinky fingernail.

TEACHER DO: Using **Calling Sticks**, choose students to estimate the length of each object, measure each object, and record their findings on the board.



STUDENTS DO: Selected students measure the objects using a ruler and record the lengths on the board.

TEACHER SAY: Now that we know how long both of these objects are we can compare them.

TEACHER DO: Select students to compare the lengths of the two objects. Examples are shown below.

- Use <, >, =.
- Ask which object is longer or shorter.
- Ask how much longer or shorter one object is than the other.



STUDENTS DO: Answer questions about the objects' lengths.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students explore estimation. They connect the concept of estimating quantity to estimating sums and differences. Front-end estimation is introduced as a mental math strategy to help students estimate the sum and difference. Later, rounding is introduced as an estimation strategy.

In computational thinking, students begin to recognize patterns, apply skills and strategies in new situations, and identify and correct their own errors. Estimation is a critical skill in all of those contexts and will help students as they work toward learning and using algorithms for addition and subtraction with regrouping. As students learn new strategies for estimating and solving problems, make sure they understand they are not learning estimation as a standalone skill. They should be prepared to use estimation to help determine the reasonableness of sums and differences as they work on more challenging problems.

1. **TEACHER SAY: Today we are going to talk about estimation. ESTIMATION is a mental math strategy that we can use to help us find the value that is close enough to the actual value using careful thinking or quick calculations. It is not a random guess. Earlier this year, we practiced estimating with addition and subtraction of 2-digit numbers. Repeat the word ESTIMATION.**



STUDENTS DO: Say: estimation.

TEACHER SAY: When we estimate, we do not expect to come up with an exact answer. We just want to get as close as possible. Let's try to estimate together. First, I am going to hold up a jar filled with _____ (objects). I will walk around the room so you can get a closer look at the jar. Once you have seen the jar up close, turn to your Shoulder Partner and make an estimate of how many _____ (objects) are in the jar. Use what you see and know about _____ (objects) to make your estimate. When you have your estimate, give me a Thumbs Up. I will record your estimates on the board.

TEACHER DO: Walk around the room and show students the jar.

STUDENTS DO: Look at the jar. Discuss estimate with **Shoulder Partner**. Give a **Thumbs Up** when done.

TEACHER DO: Call on each partner group to quickly state their estimate. Record all estimates on the board.

TEACHER SAY: Good work. We have a variety of estimates for the number of objects in this jar. Now let's find out how many there actually are. To make counting quicker and easier, I am going to group the objects into sets of 10.

TEACHER DO: Put the objects into sets of 10. Put the leftover objects in their own set.

TEACHER SAY: Now help me count. We will count by 10 and then count the extra objects that do not make a set of 10.

 **STUDENTS DO:** Count aloud with the teacher.

TEACHER DO: Circle the estimate that was the closest.

TEACHER SAY: There were _____ (objects) in this jar. We had a lot of estimates, but _____ (students' names) were the closest.

TEACHER DO: Ask students who were close to share the strategies they used to estimate.

 **STUDENTS DO:** Selected students discuss their estimation strategies.

2. TEACHER SAY: Thank you for sharing your strategies. Let's review a strategy we used to estimate the answers to addition and subtraction problems.

TEACHER DO: Record 32 + 54 = _____ on the board.

TEACHER SAY: One name for this estimation strategy is FRONT-END ESTIMATION. That means we just look at the front of the number, or the highest place value. We do not look at the other places.

TEACHER DO: Point to the 3 in 32.

TEACHER SAY: The number 32 has two places, a Tens place and a Ones place. There is a 3 in the Tens place, so we are going to think of 32 as 30. We can hold that 30 in our heads.

TEACHER DO: Point to the 5 in 54.

TEACHER SAY: The number 54 also has two places. There is a 5 in the Tens place, so we are going to think of 54 as 50. We can add 30 and 50 in our heads. Raise your hand when you have an estimate.

 **STUDENTS DO:** Mentally add 30 and 50. Raise hand when ready. Selected students share their answer.

TEACHER SAY: Good job. We found a value that is close to the actual answer. 80 is not the actual answer, but it gives us an estimate. Do you think the actual sum is more or less than 80? Pop up if you think the actual sum is more than 80.

 **STUDENTS DO:** Pop up if they think that the actual sum is more than 80.

TEACHER DO: Ask someone who is standing to explain their thinking.

Note to the Teacher: The process of reasoning and explaining why the estimate is too high or too low helps students build number sense and critical thinking.

3. TEACHER SAY: Let's try estimating the answer to a subtraction problem.

TEACHER DO: Record 82 – 37 = _____ on the board.

TEACHER SAY: In this subtraction problem, we have two 2-digit numbers. Remember, we just look at the Tens place, the highest place in these numbers. We will think of 82 as 80. We can hold 80 in our heads. Lean and Whisper what 37 will be for our estimation.

 **STUDENTS DO: Lean and Whisper**: 30.

TEACHER SAY: Good job. We will think of 37 as 30. So the estimation problem is 80 minus 30. Lean and Whisper the estimated difference.

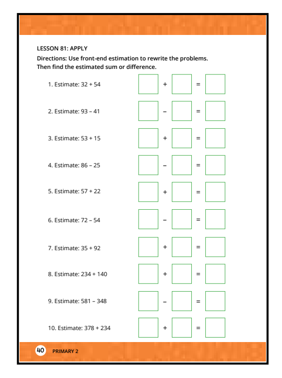


STUDENTS DO: Lean and Whisper: 50

TEACHER SAY: Yes, 80 – 30 is 50. Turn and Talk to your Shoulder Partner and explain whether the actual difference would be more or less.



STUDENTS DO: Turn and Talk to **Shoulder Partner** about the estimated versus the actual difference.



LESSON 81: APPLY

Directions: Use front-end estimation to rewrite the problems. Then find the estimated sum or difference.

1. Estimate: 32 + 54 ☐ + ☐ = ☐
2. Estimate: 93 – 41 ☐ – ☐ = ☐
3. Estimate: 53 + 15 ☐ + ☐ = ☐
4. Estimate: 86 – 25 ☐ – ☐ = ☐
5. Estimate: 57 + 22 ☐ + ☐ = ☐
6. Estimate: 72 – 54 ☐ – ☐ = ☐
7. Estimate: 35 + 92 ☐ + ☐ = ☐
8. Estimate: 234 + 140 ☐ + ☐ = ☐
9. Estimate: 581 – 348 ☐ – ☐ = ☐
10. Estimate: 378 + 234 ☐ + ☐ = ☐

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4. TEACHER SAY: In both problems, we looked at the front end of the number and used that to help us find an estimated sum or difference. Take out your Mathematics Student Book and turn to page Lesson 81: Apply.



STUDENTS DO: Take out Mathematics Student Book and turn to page Lesson 81: Apply.

TEACHER SAY: On this page, you have addition and subtraction problems. Use front-end estimation to rewrite the problem and then find the estimated sum or difference. The first one is the example that we did together and is done for you. Next to each problem are boxes for you to write the estimated problem and find the sum or difference. You will work independently to solve as many as you can in the time we have left.



STUDENTS DO: Work independently to solve as many front-end estimation problems as they can in the time left in the Learn segment.

TEACHER DO: Walk around the room, observing students as they work. Note who may be having trouble estimating the sums or differences using front-end estimation and offer help when needed.

Note to the Teacher: As an extension activity, have students who finish early use a set of numeral cards to create two 3-digit numbers and estimate the sum of the two numbers. They can work alone or in pairs.

When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: Good work today using front-end estimation to estimate sums and differences. Put away your student book and pencil.



STUDENTS DO: Put away materials.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students consider when it might be okay to estimate and when we might need an exact answer.

1. TEACHER SAY: Today we estimated the number of a group of objects and then used front-end estimation to estimate sums and differences. We know that an estimate is often close to the real value but not the exact value. When might it be fine just to get an estimate of the sum or difference? When might it be important to find the exact sum?

Turn to your Shoulder Partner and share your thinking. I will use the Calling Sticks to choose a few students to share with the group.

TEACHER DO: Give students 1 to 2 minutes to talk with a **Shoulder Partner** and then use **Calling Sticks** to choose students to share their thinking with the larger group.



STUDENTS DO: Talk to a **Shoulder Partner** about when to use an estimated sum or difference versus an exact answer. Selected students share their thinking with the larger group.

TEACHER SAY: Great work today. I love hearing your math ideas. In our next lesson, we will look at another way to estimate that might get us a little closer to the exact answer.

Lesson 82 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Round 2-digit numbers to the nearest Ten.
- Round two 2-digit numbers to estimate their sum.

KEY VOCABULARY

- Difference
- Estimation
- Front-end estimation
- Place value
- Rounding
- Sum

MATERIALS

- Calendar Math area
- Two sets of number cards (30 through 40/70 through 80 and 20 through 30/50 through 60)
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make two sets of cards showing the numbers 30 through 40/70 through 80 (Set 1) and 20 through 30/50 through 60 (Set 2). See Chapter Preparation for the Teacher for detailed instructions and an example.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at two new objects (or lines) today and measure and compare them as we did in our last math lesson. I will use Calling Sticks to select helpers.

TEACHER DO: Repeat the same procedure as in Lesson 81, displaying two objects or lines, selecting students to measure, and asking questions to help students compare the length of the two objects or lines.



STUDENTS DO: Selected students measure the objects or lines. All students answer questions about the lengths of the two objects or lines.

Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students review front-end estimation and explore rounding to the nearest Ten as an estimation strategy that results in an estimate that is closer to the actual value. Again, it is important for students to think about how each estimation strategy alters the final sum or difference from the actual amount. Students will continue to practice rounding throughout the primary grades, specifically with whole numbers, decimals, and fractions. This early practice lays the foundation for future success in more challenging math work. For students who struggle with the newly introduced concept of rounding, provide additional small group instruction and practice as needed using the available manipulatives and instructional strategies.

Computational thinking involves recognizing and creating more effective and efficient processes. As students learn and practice estimation, they are often given a choice as to the strategy they will use. Over time, they should begin to recognize that rounding provides a more accurate estimation and choose that strategy more consistently.

1. TEACHER DO: Write 31 + 78 on the board.

TEACHER SAY: In our last math lesson, we talked about estimation. What do you know about estimation? Turn to your Shoulder Partner and share what you know. I will give you one minute, and then I will use the Calling Sticks to select some of you to share with the class.



STUDENTS DO: Talk to **Shoulder Partner** about estimation.

TEACHER DO: After about one minute, use the **Calling Sticks** to select students to share what they know about estimation. Confirm accurate responses. Correct misconceptions. Students should mention the following: using place value to estimate, estimates are not exact answers, there are different estimation strategies.

TEACHER SAY: Great thinking. Now turn to your Shoulder Partner and find an estimated sum for the problem on the board. Give me a Thumbs Up when you are ready to share your estimate and explain how you got it.



STUDENTS DO: Estimate the sum with a **Shoulder Partner**. Give a **Thumbs Up** when ready to share. Share answers and explanations.

TEACHER SAY: Good job. If we front-end estimate this problem, looking only at the value of the numbers in the Tens place, we could say 30 + 70 has an estimated sum of 100. Think about that sum for a moment. It is close to the actual answer, but it is not exact. Is the actual sum less than 100 or more than 100? Lean and Whisper.

TEACHER DO: Use the 120 Chart to model adding 30 and 70, if needed. Review the mental math strategies of starting with the larger number and adding tens.



STUDENTS DO: Lean and Whisper if they think the estimated sum is more or less than 100.

TEACHER SAY: Some of you whispered less and some whispered more. Raise your hand if you would like to explain why you think the estimated sum of 100 is less than the actual sum.



STUDENTS DO: Raise hand to volunteer. Selected students explain why they think the estimated sum is too low.

TEACHER DO: Build on students' responses by confirming accurate thinking.

TEACHER SAY: When we front-end estimate, we look only at the number with the highest place value. But if the other numbers are high, that can make our estimate less accurate. For example, in the problem on the board, the number 31 is pretty close to 30. But 78 is actually closer to 80 than 70. We changed it to 70 for our estimate because we only looked at the Tens place. This made our front-end estimate a lot lower than the actual sum.

TEACHER DO: If necessary, explain the concept again in a different way to help struggling students understand. Consider asking students who understand to explain it to the class.

2. **TEACHER SAY: To get our estimate closer to the exact answer, we can use an estimation strategy called ROUNDING. When we ROUND numbers, we make it easier to mentally add or subtract them.**

I am going to show you how to ROUND numbers, but I need 11 helpers. If I call your name, come to the front of the room. I will give you a card. There are numbers on both sides of the card. Hold up the side that shows a number between 30 and 40 and put yourselves in order from 30 to 40.

TEACHER DO: Use **Calling Sticks** to choose 11 students. Give each student a card from Set 1.

 **STUDENTS DO:** Selected students come to the front, take a card, and stand in numerical order from 30 to 40.

TEACHER SAY: Which Tens numbers do you see up here? Call out.

 **STUDENTS DO:** Call out 30 and 40.

TEACHER SAY: Good. If you are holding the 30 or the 40, hold it high in the air.

 **STUDENTS DO:** Selected students hold their numbers high in the air.

TEACHER SAY: Thank you. If we use the front-end estimation strategy, we just look at the Tens place and think of 31 as 30. But to round 2-digit numbers, we also look at the Ones place and think about which Tens number we are closest to. Let's look at 31, for example. If you are holding the card 31, step forward.

 **STUDENTS DO:** Selected student steps forward.

TEACHER SAY: 31 has 3 Tens and 1 One. 31 is in between 30 and 40, but which Ten is it closer to? Lean and Whisper if 31 is closer to 30 or to 40.

 **STUDENTS DO: Lean and Whisper**: 30.

TEACHER DO: Point out that the student holding 31 is standing closer to the student holding 30 than the student holding 40.

TEACHER SAY: Yes, 31 is closer to 30, so we can round 31 to 30.

TEACHER DO: Have students return their cards to you and sit. Use **Calling Sticks** to select 11 new student helpers. Have students show numbers 70 to 80 and stand in numerical order.

 **STUDENTS DO:** Selected students come to the front, take a card, and stand in numerical order from 70 to 80.

TEACHER SAY: We now have a line of numbers that start at 70 and go to 80. Which Tens numbers do you see up here? Call out.

 **STUDENTS DO:** Call out: 70 and 80.

TEACHER SAY: Good. If you are holding the 70 or the 80, hold it high in the air.

 **STUDENTS DO:** Selected students hold their numbers high in the air.

TEACHER SAY: Let's round number 78 to the nearest Ten. Will 78 step forward?

 **STUDENTS DO:** Selected student steps forward.

TEACHER SAY: If we use the front-end estimation strategy and look only at the Tens place, 78 becomes 70 since it has 7 Tens. However, look at where 78 is in our number line. Is 78 closer to 70 or 80? Lean and Whisper.

STUDENTS DO: Lean and Whisper: 80.

TEACHER SAY: Yes, 80 is the nearest Ten, so we round 78 up to 80. That means if we estimate the sum of 31 and 78 using the rounding strategy, we would add 30 and 80. The sum would be 110 instead of 100. This estimate is a little closer to the exact sum of 31 and 78, which is 109.

3. TEACHER DO: Have students return their cards to you and sit. Use **Calling Sticks** to select 11 new student helpers. Give the helpers the cards from Set 2. Have students show numbers 50 to 60 and stand in numerical order.

STUDENTS DO: Selected students come to the front, take a card, and stand in numerical order from 50 to 60.

TEACHER DO: Write 54 + 25 = _____ on the board as shown below.

54	+	25	=	
	+		=	

TEACHER SAY: Let's use the rounding strategy to estimate the sum of 54 and 25. We have numbers 50 to 60 in a line. What Tens numbers do you see? Call out.



STUDENTS DO: Call out: 50 and 60.

TEACHER SAY: If you are holding 50 or 60, hold them high in the air.



STUDENTS DO: Selected students hold 50 and 60 in the air.

TEACHER SAY: Will the student holding 54 please step forward?



STUDENTS DO: Helper steps forward.

TEACHER SAY: Is 54 closer to 50 or 60? What is the nearest Ten?



STUDENTS DO: Call out: 50.

TEACHER SAY: Yes, 54 is closer to 50, so we can round 54 down to 50.

TEACHER DO: Write 50 on the board below 54.

54	+	25	=	
50	+		=	

TEACHER SAY: Turn your cards over.



STUDENTS DO: Turn cards over to show numbers 20 to 30.

TEACHER SAY: What Tens do you see? Call out.



STUDENTS DO: Call out: 20 and 30.

TEACHER SAY: Good. If you are holding 20 or 30, hold your card high in the air.



STUDENTS DO: Selected students hold their cards in the air.

TEACHER SAY: Our second addend is 25, so if you are holding 25, step forward.



STUDENTS DO: Helper steps forward.

TEACHER SAY: Raise your hand if you can tell us how we should round 25. Is 25 closer to 20 or closer to 30? What is the nearest Ten?



STUDENTS DO: Raise hand to volunteer. Selected students share their answers and explain their thinking.

Note to the Teacher: Some students will think they should round up to 30, while others will think they should round down to 20. For the moment, allow both answers and have students explain their thinking.

TEACHER SAY: This is a tricky one. Some of you think 25 should round down to 20 and some think it should round up to 30. There are 5 people or numbers before 25 and 5 people or numbers after 25. It is exactly in the middle between 20 and 30.

TEACHER DO: Point out the 5 students before 25 and the 5 students after 25 so students can see that 25 is exactly in the middle.

TEACHER SAY: Mathematicians needed to figure out how to round numbers that are right in the middle. They did not want some people to round up and some to round down, so they made a rule: If a number is exactly in the middle between two Tens, the rule is you round up. So 25 rounds up to 30.

TEACHER DO: Record 30 under 25 on the board.

$$\boxed{54} + \boxed{25} = \boxed{}$$

$$\boxed{50} + \boxed{30} = \boxed{}$$

TEACHER SAY: Now that we have rounded 54 and 25 to the nearest Ten, we can find an estimated sum. Lean and Whisper the estimated sum of 50 and 30.



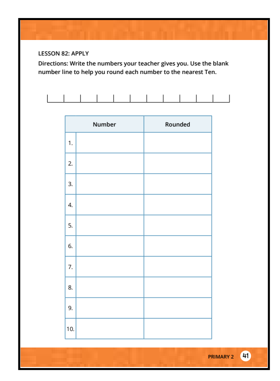
STUDENTS DO: Lean and Whisper: 80.

TEACHER SAY: Yes, 80. That estimate is very close to the actual sum, which is 79.

TEACHER DO: Have volunteers give the cards to you and return to their seats.



STUDENTS DO: Volunteers return to their seats.



LESSON 82: APPLY

Directions: Write the numbers your teacher gives you. Use the blank number line to help you round each number to the nearest Ten.

	Number	Rounded
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

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4. TEACHER SAY: Rounding is a great estimation strategy and can help us estimate more accurately. For the rest of the Learn segment, you will practice rounding numbers to the nearest Ten. Open your Mathematics Student Book to page Lesson 82: Apply.



STUDENTS DO: Open Mathematics Student Book and turn to page Lesson 82: Apply.

TEACHER SAY: I am going to give you 2-digit numbers using my number cards. You will work with your Shoulder Partner to round each number to the nearest Ten.

TEACHER DO: Shuffle Set 1 and Set 2 cards together. Select one card and hold it so all students can see it.

TEACHER SAY: Write the number in your student book. Then work with your partner to round it to the nearest Ten. I will use Calling Sticks to select one of you to share your answer and explain your thinking.



STUDENTS DO: Record the number. Work with **Shoulder Partner** to round it to the nearest Ten. Selected student shares their answer and explains their thinking.

TEACHER DO: Help students at the board as needed. Repeat the process until the end of the Learn segment.

TEACHER SAY: Good work today rounding numbers. Put away your student book and pencil.

 **STUDENTS DO:** Put away materials.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students explored rounding numbers to the nearest Ten. For Reflect, they apply their learning to a new rounding situation: rounding a 3-digit number. It is not expected that students will have mastered the concept or act of rounding. The goal of this Reflect discussion is for you to gather information about students' current understanding and misconceptions, to see which students are able to apply their understanding in new situations, and for students to continue to learn from each other.

1. TEACHER DO: Write 182 on the board.

TEACHER SAY: Today we practiced rounding 2-digit numbers to the nearest Ten. Reflect on what you learned today. How could we round a 3-digit number like 182? Think for a moment, then share your thinking with your Shoulder Partner. Give me a Thumbs Up when you are ready.

 **STUDENTS DO:** Think for a minute about how to round 182. Share their thinking with their **Shoulder Partner**. Give a **Thumbs Up** when ready. Selected students share their thinking.

TEACHER DO: Some students may suggest rounding to the nearest Ten. Others may suggest rounding to the nearest Hundred. Both are appropriate strategies. Use this opportunity to take note of students' thinking. Who seems to understand how to round numbers? Who is confused or has misconceptions that could cause errors in the future? Who is able to apply their understanding to the new rounding context?

TEACHER SAY: Wow, that was a very interesting discussion. Good work today. In our next math lesson, we will continue to practice estimation strategies. Give your Shoulder Partner a high five.

Lesson 83 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply estimation strategies in problem-solving situations. • Estimate sums and differences. • Round 3-digit numbers to the nearest Hundred.	• Difference • Estimation • Front-end estimation • Rounding • Sum	• Calendar Math area • Set of 3-digit number cards • Estimating Sums and Differences Cards (one set per small group) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a set of number cards showing 3-digit numbers on the front and back. See Chapter Preparation for the Teacher for detailed instructions and an example.

Print sets of Estimating Sums and Differences Cards (one set for each small group of students). See the Estimating Sums and Differences Cards Blackline Master.

Consider creating the student groups in advance so Learn time is used efficiently.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at two new objects (or lines) today and measure and compare them as we did in our last math lesson. I will use Calling Sticks to select helpers.

TEACHER DO: Repeat the same procedure as in Lesson 81, displaying two objects or lines, selecting students to measure, and asking questions to help students compare the length of the two objects or lines.



STUDENTS DO: Selected students measure the objects or lines. All students answer questions about the lengths of the two objects or lines.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students practice estimating sums and differences. Since students may choose which estimation strategy they want to use, they will arrive at different answers. That is acceptable. This experience promotes mathematical discussion and deeper understanding of estimation. If students struggle with the newly introduced concept of rounding, consider providing additional small group instruction and practice using the available manipulatives and instructional strategies.

1. **TEACHER DO:** Write 130 + 480 = ______ on the board.

TEACHER SAY: In our last math lesson, we explored how to round 2-digit numbers as an estimation strategy. Both the rounding method and the front-end estimation method help us get an answer that is close to the actual value.

Look at the problem on the board. Work with your Shoulder Partner to use the front-end estimation strategy to estimate the sum of those two numbers. Remember that in front-end estimation, we just look at the numbers in the place with the greatest value. What place is that for these two numbers?

 **STUDENTS DO:** Call out: Hundreds.

TEACHER SAY: Yes. Look at the Hundreds place and use the front-end estimation strategy to estimate the sum. Give me a Thumbs Up when you have an estimate.

 **STUDENTS DO:** Work with their **Shoulder Partner** to estimate the sum of 130 and 480 using the front-end estimation strategy. Give a **Thumbs Up** when done. Selected students share their thinking.

TEACHER SAY: Good. If we use the front-end estimation strategy, we change 130 to 100 and 480 to 400. 100 plus 400 is 500.

TEACHER DO: Write 100 under 130 and 400 under 400. Write the estimated sum: 500.

TEACHER SAY: What if we wanted to use the rounding strategy to come up with an estimated sum? Would we get a different estimate? Share your thinking with your Shoulder Partner.

 **STUDENTS DO:** Share their thinking with their **Shoulder Partner**.

TEACHER SAY: We are going to make a number line as we did yesterday, but our cards will have 3-digit numbers instead of 2-digit numbers. Since the numbers go to the Hundreds place, we will round to the nearest Hundred. If I call your name, come to the front and take a card. Hold up the side showing numbers 100 through 200 and put yourselves in order from 100 to 200.

TEACHER DO: Use **Calling Sticks** to choose 11 students. Give each student a card with numbers.

 **STUDENTS DO:** Selected students come to the front, take a card, and stand in numerical order showing the numbers 100 to 200.

TEACHER SAY: Look at the numbers. What do you notice about them? Raise your hand.

 **STUDENTS DO:** Raise hand to volunteer. Selected students share their thinking.

TEACHER DO: Students should notice that the numbers go from 100 to 200, counting by 10. If no students mention it, be sure to point it out.

TEACHER SAY: Which Hundreds do you see? Call out.

 **STUDENTS DO:** Call out: 100 and 200.

TEACHER SAY: Yes. If you are holding 100 or 200, hold your card high in the air.

 **STUDENTS DO:** Selected students hold their cards in the air.

TEACHER SAY: 130 is the first number in our addition problem. If you are holding the 130 card, step forward.

 **STUDENTS DO:** Helper steps forward.

TEACHER SAY: 130 has 1 Hundred and 3 Tens. It is in between 100 and 200, but which Hundred is it closer to? Lean and Whisper if 130 is closer to 100 or to 200.

 **STUDENTS DO: Lean and Whisper**: 100.

TEACHER SAY: Yes, 130 is closer to 100. In this case, rounding to the nearest Hundred gives us 100 just like front-end estimation does.

TEACHER DO: Write 100 on the board under 130.

TEACHER SAY: Now let's look at our second addend, 480. Everyone turn your cards over. What Hundreds numbers do you see? Call out.

 **STUDENTS DO:** Call out: 400 and 500.

TEACHER SAY: If you are holding numbers 400 or 500, please hold them high in the air.

 **STUDENTS DO:** Selected students hold their cards in the air.

TEACHER SAY: We now have a line of numbers that start at 400 and go to 500. If you are holding 480, step forward.

 **STUDENTS DO:** Helper steps forward.

TEACHER SAY: Is 480 closer to 400 or to 500? Lean and Whisper.

 **STUDENTS DO: Lean and Whisper**: 500.

TEACHER SAY: Yes, in this problem 480 has 4 Hundreds and 8 Tens, so the nearest Hundred is 500. We round up to 500.

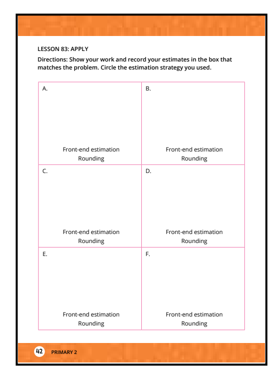
TEACHER DO: Write 500 under 480.

TEACHER SAY: What is 100 plus 500?

 **STUDENTS DO:** Call out: 600.

TEACHER SAY: Great job. When we use the rounding strategy, the estimated sum of 130 + 480 is 600. That is a different estimate than the one we got using the front-end estimation strategy. So, depending on your method of estimating, you could have different answers. The actual sum of 130 and 480 is 610. Which estimation strategy got us closer to the actual sum?

 **STUDENTS DO:** Respond: rounding.


LESSON 83: APPLY

Directions: Show your work and record your estimates in the box that matches the problem. Circle the estimation strategy you used.

A. Front-end estimation / Rounding	B. Front-end estimation / Rounding
C. Front-end estimation / Rounding	D. Front-end estimation / Rounding
E. Front-end estimation / Rounding	F. Front-end estimation / Rounding

42 PRIMARY 2

TEACHER SAY: Open your Mathematics Student Book to page Lesson 83: Apply.

 **STUDENTS DO:** Take out Mathematics Student Book and turn to page Lesson 83: Apply.

2. TEACHER SAY: In your book, there is an empty chart with boxes. Each box has a letter in the upper left-hand corner. The boxes are where you will record your estimated sums and differences. You will work in small groups, and I will bring your group a set of cards. Each card has a letter in the corner. Your estimate for problem A, goes in box A. Your estimate for Problem B goes in box B, and so on. Let's look at a couple of cards.

TEACHER DO: Hold up the card with the letter A in the corner and then another card where the problem is written vertically.

TEACHER SAY: Each card has an addition or a subtraction problem on it. Some are written horizontally and some are written vertically. The first thing your group will do is look at the problem and decide how you want to estimate the sum or difference. You can use front-end estimate or you can use rounding. Once you choose a strategy, circle it. Let's do this first one together.

TEACHER DO: Show card A again and write 68 + 52 = _____ on the board.

TEACHER SAY: Card A says 68 + 52. To estimate this sum, I can round both 2-digit numbers to the nearest Ten or I can use the front-end estimation strategy. Turn to your Shoulder Partner and discuss how you might estimate this sum. Give me a Thumbs Up when you have an estimated sum.

STUDENTS DO: Turn to **Shoulder Partner** and find the estimated sum. Give a **Thumbs Up** when finished.

TEACHER SAY: Pop up if you found an estimated sum using front-end estimation. I will choose a Shoulder Partner pair to explain their thinking at the board.

STUDENTS DO: Pop up if they used the front-end estimation strategy.

TEACHER DO: Choose a **Shoulder Partner** pair to come to the front and explain their work.

STUDENTS DO: Selected students share how they estimated the sum and show their work on the board. Sit when finished.

TEACHER SAY: Great. Now pop up if you used rounding to estimate this sum.

STUDENTS DO: Pop up if they used rounding to find the estimated sum.

TEACHER DO: Choose a **Shoulder Partner** pair to come to the front and explain their work.

STUDENTS DO: Selected students share how they estimated the sum and show their work on the board. Sit when finished.

TEACHER SAY: Good job. Remember, we can use different estimation strategies to get an estimate. Estimating an answer before we find the sum or difference is helpful because it gives us an idea of the actual answer. For the rest of Learn time today, you will work with a group to practice estimation. Work together. You may solve the problems in any order.

TEACHER DO: Tell students which group they are in.

TEACHER SAY: Sit with your group. Take your student book and pencil with you. Once you are seated, I will give you a set of cards. Once you have your cards, begin working.

TEACHER DO: Hand out cards to small groups.



STUDENTS DO: Move to sit with their small group. Take student book and pencil. Begin working once they have their cards.

Note to the Teacher: The card sets include 2-digit and 3-digit numbers. They are written horizontally and vertically so students have exposure to both. Since students may choose which problems they want to work on, some may only want to solve the problems with 2-digit numbers while others may want to solve the problems with 3-digit numbers. Also, some may stick to addition problems, while others may feel comfortable with both addition and subtraction. Pay attention to all of this since it gives you information about how well your students understand the concepts and their level of comfort with the work.

TEACHER DO: Walk around the class, observing students as they work and talk together. Offer help where needed and note students who are having difficulty estimating, as well as which students

like to front-end estimate and which students like to round to find an estimate. When Learn time is over, use an **Attention Getting Signal**.

Note to the Teacher: As an extension activity, have students who finish early solve the problems using the estimation strategy they did not use the first time. Have them compare their estimated sums and differences. Improving performance and recognizing patterns are important computational thinking skills. The extension activity provides an opportunity for students to compare their estimates and draw conclusions about which strategy provides the best estimates.

TEACHER SAY: Good work today. Return your cards to me. Go back to your seat and keep out your student book for Reflect.

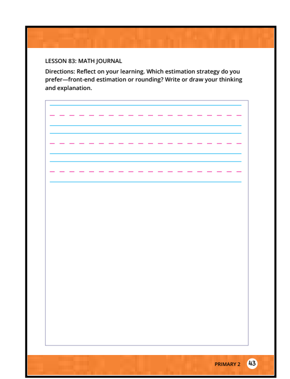
 **STUDENTS DO:** Clean up materials and return to seat.



Reflect (5 minutes)

Directions

Note to the Teacher: For the past three days, students have been exploring estimation. For Reflect, they write about the estimation strategy they prefer and why. If time allows, have students share their thinking with their **Shoulder Partner**. *This type of mathematical discussion builds deeper understanding of the math content and helps students understand that there are often multiple ways to look at a given problem.*



1. **TEACHER SAY: Turn to page Lesson 83: Math Journal in your student book.**

 **STUDENTS DO:** Turn to page Lesson 83: Math Journal.

TEACHER SAY: Today you had some choice in how you estimated. Reflect on your learning. Then write or draw on your Math Journal page which estimation strategy you prefer to use and why.

 **STUDENTS DO:** Reflect on learning. Write or draw which estimation strategy they prefer and why.

TEACHER DO: Be sure to look at student books to see what students are saying about estimation. When Reflect time is over, use an **Attention Getting Signal**.

TEACHER SAY: You are really getting good at estimating. I am very proud of you. In our next math lesson, we will return to finding exact sums and differences. But this work with estimation will help us be more thoughtful mathematicians since we can have an estimate of the sum or difference before we even add or subtract. If our estimate and our actual answer are very different, that tells us we did something wrong. Put away your student book and pencil and give your Shoulder Partner a high five.

 **STUDENTS DO:** Put away materials and give **Shoulder Partner** a high five.

Lesson 84 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add 2-digit numbers with regrouping. • Explain why it is sometimes necessary to regroup to solve problems.	• Estimation • Place value • Regrouping	• Calendar Math area • Large place value mat • Sets of bundled and loose straws (one set per small group of students) • Tape • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a large Tens–Ones place value mat to use for modeling.

Create sets of bundled and loose straws for each small group of students. See Chapter Preparation for the Teacher for detailed instructions.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at two new objects (or lines) today and measure and compare them as we did in our last math lesson. I will use Calling Sticks to select helpers.

TEACHER DO: Repeat the same procedure as in Lesson 81, displaying two objects or lines, selecting students to measure, and asking questions to help students compare the length of the two objects or lines.



STUDENTS DO: Selected students measure the objects or lines. All students answer questions about the lengths of the two objects or lines.

Learn (40 minutes)

Directions

Note to the Teacher: The next seven lessons focus on adding with and without regrouping. Students have been introduced to regrouping in previous themes and most recently regrouped using money. Students will work again on subtraction with regrouping in the final theme of the year. Today's lesson reviews ideas that were presented earlier to refresh students' understanding.

This lesson references straws. If your students are using a different materials, such as wooden sticks, change the references in the lesson to those materials.

1. TEACHER DO: Display the large Tens–Ones place value mat on the board. Have 10 straw bundles (Tens) and 19 loose straws (Ones) to model. Write 53 + 28 on the board vertically.

TEACHER SAY: Today we are going to work on regrouping again. We talked about this before with 2-digit numbers and when we added money. Look at the problem on the board. Let's begin by estimating the sum to get an idea what the answer will be. Give me a Thumbs Up if you can estimate this sum. You can use either strategy.

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share their estimates and explain their thinking.

TEACHER SAY: Good, now we have an idea of what the sum of this problem might be. Today we are going to find the exact sum of two numbers, just as we did with money. We will have to regroup to solve the problems, so let's review how to regroup when we have too many Ones in the Ones place. First, I am going to use straws to build these two numbers.

TEACHER DO: Show students your straw bundles and loose straws.

TEACHER SAY: I have some bundles of straws and some loose straws. Each bundle has 10 straws and is wrapped with a rubber band. It represents a group of 10. Lean and Whisper how many bundles and how many loose straws I will need to represent 53.

 **STUDENTS DO: Lean and Whisper**: 5 bundles and 3 loose straws.

TEACHER SAY: Yes, 53 has 5 Tens, so 5 bundles, and 3 Ones, so 3 loose straws. I am going to tape these to the place value mat.

TEACHER DO: Tape the bundles in the Tens column and the loose straws in the Ones column.

TEACHER SAY: How many bundles and loose straws do I need to represent 28? Lean and Whisper.

 **STUDENTS DO: Lean and Whisper**: 2 bundles and 8 loose straws.

TEACHER DO: Tape the straws representing 28 to the place value mat (under the straws representing 53).

TEACHER SAY: Good, so now we have built both of the numbers in our addition problem using straws. Let's look at the Ones on our mat in this problem. 53 has 3 Ones, and 28 has 8 Ones. Clap if 3 + 8 is more than 10. Snap if it is exactly 10, or stomp if it is less than 10.

 **STUDENTS DO:** Clap, snap, or stomp depending on understanding of 8 + 3.

TEACHER SAY: We know that 8 + 2 = 10, so 8 + 3 is one more than that, so 8 + 3 is 11. That means that I have more than 10 Ones, and I can make a new group of 10.

TEACHER DO: Model how to make a bundle of 10 straws, leaving 1 straw behind.

TEACHER SAY: I made one new bundle of 10. Can it stay in the Ones place?



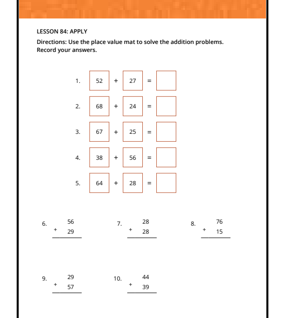
STUDENTS DO: Call out: no.

TEACHER SAY: No, now that I have regrouped the straws into a bundle of 10, I have to move it to the Tens column. Now we have only 1 straw in the Ones place and I can find the exact sum. Turn to your Shoulder Partner and figure out the sum of 53 + 28. Give me a Thumbs Up when you are ready.



STUDENTS DO: Calculate the sum of 53 and 28 with **Shoulder Partner**. Give a **Thumbs Up** when ready. Selected students share their answers.

TEACHER SAY: Good job. The sum is 81. We had too many Ones straws in the Ones place, so we regrouped 10 of them into a new bundle and moved the new bundle to the Tens place. You are going to practice regrouping using straws and a place value mat. Some of you may already be able to find the sum without the straws, but building the numbers and physically regrouping them helps our math brains understand the process in a deeper way. So, for today I am going to ask you to use the straws and physically regroup.



LESSON 84: APPLY

Directions: Use the place value mat to solve the addition problems. Record your answers.

1. 52 + 27 = ☐
2. 68 + 24 = ☐
3. 67 + 25 = ☐
4. 38 + 56 = ☐
5. 64 + 28 = ☐

6. 56 + 29
7. 28 + 28
8. 76 + 15
9. 29 + 57
10. 44 + 39

44 PRIMARY 2

Open your Mathematics Student Book to page Lesson 84: Apply.

STUDENTS DO: Find page Lesson 84: Apply in the student book.

TEACHER SAY: There are some addition problems in your book on one page and a place value mat on the other page. Build each number on the mat just as I did on my mat. It is okay if the straws do not fit exactly on your mat. If you have too many Ones in the Ones place, work with your friends to regroup them into a bundle of 10. Then calculate the exact sum and record your answer in your book. Give me a Thumbs Up if you understand the task.



STUDENTS DO: Give a **Thumbs Up** to show understanding. Ask questions if necessary.

TEACHER SAY: Next, you and your Shoulder Partner find another pair of partners and sit together. You have one minute.



STUDENTS DO: Find a pair of partners to work with. Sit together.

TEACHER SAY: I will bring you place value straws, and 2 extra rubber bands. Work together to build, regroup, and find the exact sum for each addition problem. Use the place value mat in one of your books. Once you have your materials, you may begin.

TEACHER DO: Hand out supplies to each group.



STUDENTS DO: Work with group to practice regrouping and adding using place value models. Record sums.

TEACHER DO: Observe students as they work and talk together. Note who is having difficulty and offer assistance where necessary. At the end of Learn time, use an **Attention Getting Signal**.

TEACHER SAY: Nice work today adding and regrouping. Please put all of the straws back into the bag, return your supplies to me, and return to your seat for Reflect.



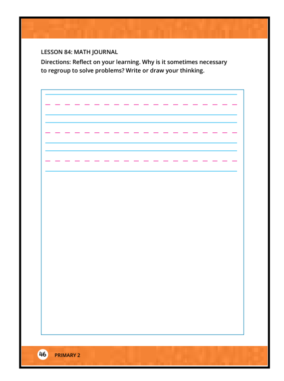
STUDENTS DO: Give supplies to the teacher and return to their seat.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students write about why it is sometimes necessary to regroup to solve problems.



1. TEACHER SAY: **Turn to page Lesson 84: Math Journal in your student book.**

 STUDENTS DO: Turn to page Lesson 84: Math Journal.

TEACHER SAY: **Today we reviewed the concept of regrouping. Reflect on your learning about regrouping. Why is it sometimes necessary to regroup to solve problems?**

 STUDENTS DO: Reflect on their learning. Think for a minute and then write or draw a response to the prompt.

TEACHER DO: Give students 3 or 4 minutes to respond to the prompt. As students work, walk around and read some of their entries. Be sure to read students' entries at a later time. They will provide valuable information about their learning.

TEACHER SAY: **Great work today. Put away your pencil and student book. Give yourself a pat on the back.**

 STUDENTS DO: Put away materials and give themselves a pat on the back.

Lesson 85 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use place value models to regroup and add. • Add two 2-digit numbers with regrouping.	• Place value • Regrouping	• Calendar Math area • Objects for measurement review • Large place value mat • Sets of bundled and loose straws (one set per small group of students) • Tape • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather/identify 3 objects, one that should be measured in centimeters, one that should be measured in meters, and one that should be measured in grams. For example, a pencil, the chalkboard, and a handful of raisins or paper clips.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

Note to the Teacher: In this review, students select the ideal unit of measurement for each item. Please note that grams are included intentionally. No students should stomp. If any students do stomp, provide additional instructional support and review activities as needed.

2. TEACHER SAY: For the past four lessons, we have measured and compared the lengths of objects. Today I am going to show you three objects. For each object, think about what unit of measure I should use to measure its length. If you think I should use centimeters, pop up. If you think I should use meters, clap. If you think I should use grams, stomp. After each object, I will ask one of you to explain why you chose that particular unit of measure.

TEACHER DO: Hold up or point to objects. Wait for students to pop up, clap, or stomp. Call on a student who chose the correct unit of measure to explain their thinking. Repeat for all 3 objects.



STUDENTS DO: For each object, determine which unit of measure should be used. Pop up, clap, or stomp depending on unit chosen. Selected students explain why they chose the particular unit of measure.

Learn (40 minutes)

Directions

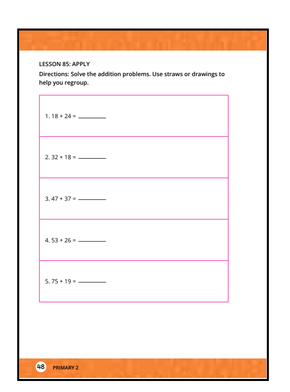
Note to the Teacher: In this lesson, students continue to practice adding with regrouping using place value models. In today's lesson, students move from using concrete models (straws) to abstract models (drawings) as they work toward learning the algorithm for regrouping and adding.

Using models and place value to solve problems help students develop and use abstractions, an important practice in computational thinking. Provide multiple opportunities for students to explore the use of physical models and place value drawings. Consider setting up a math center with materials and practice problems. If possible, include an answer key so students can check and correct their own work. Many students will find the extra independent practice (without the pressure of peers or having their work scored) valuable.

1. TEACHER DO: Display the large place value mat. Have straw manipulatives available. Begin the lesson by having students explain the reason and process for regrouping. Write 18 + 24 = ______ on the board. Encourage students to use place value models (such as straws).



STUDENTS DO: Selected students explain the regrouping process and why regrouping is sometimes necessary.



LESSON 85: APPLY

Directions: Solve the addition problems. Use straws or drawings to help you regroup.

1. 18 + 24 = ______
2. 32 + 18 = ______
3. 47 + 37 = ______
4. 53 + 26 = ______
5. 75 + 19 = ______

48 PRIMARY 2

TEACHER SAY: We can also use drawings to represent numbers and regrouping. Let's review that together. Open your Mathematics Student Book to page Lesson 85: Apply. Our practice problem is on the page. Draw Tens sticks and Ones squares to solve the problem.

TEACHER DO: Use this as a preassessment to determine what students remember about regrouping.



STUDENTS DO: Draw the problem and solve it in their Mathematics Student Book.

TEACHER DO: When students are finished, have a volunteer model how to solve the problem at the board.



STUDENTS DO: Selected student models using place value drawings to solve the addition problem with regrouping.

2. TEACHER SAY: You are going to work with your Shoulder Partner to solve the addition problems in your student book. For each problem, determine if regrouping is needed. Decide if you will use straws or drawings to help you regroup. I will put one or two sets of straws at each table, but you do not have to use them if you want to draw instead. Once you have your materials, you and your partner may begin working.

TEACHER DO: Hand out place value straws and rubber bands to each table. Although students are working in pairs, small groups can share materials. Not every student will use them.



STUDENTS DO: Work with **Shoulder Partner** to solve the addition problems. Use straws or place value drawings to model regrouping. Record answers in the student book.

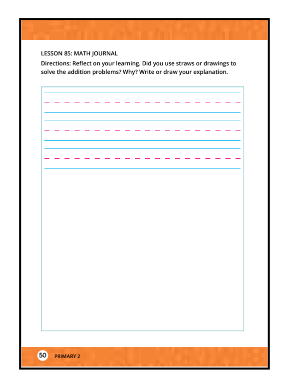
TEACHER DO: Walk around and observe students as they work and talk. Offer help as needed. Take note of struggling students who may need some additional instruction or practice. When students are finished, collect the materials.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on why they chose to use straws or drawings to model regrouping and solve the problems.



LESSON 85: MATH JOURNAL

Directions: Reflect on your learning. Did you use straws or drawings to solve the addition problems? Why? Write or draw your explanation.

50 PRIMARY 2

1. TEACHER SAY: **Today you practiced regrouping and adding. You were given the option of using straws or drawings to model regrouping. Reflect on why you chose to use the strategy you used—straws or drawings. Write down your thoughts on the Lesson 85: Math Journal page.**

 STUDENTS DO: Reflect on learning. Think about the question and record thoughts in the student book.

TEACHER DO: Give students 3 or 4 minutes to complete the Math Journal entry.

TEACHER SAY: **Great work today, class. You may put away your student book. Give your Shoulder Partner a high five.**

 STUDENTS DO: Put away materials and give partner a high five.

Lesson 86 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use place value models to regroup and add. • Add two 3-digit numbers with regrouping.	• Review vocabulary as needed.	• Calendar Math area • Objects for measurement review • Large place value mat • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather/identify 3 objects that can be measured in grams or kilograms (have at least one of each). For example, a pencil, a large book, and a handful of raisins or paper clips.



Calendar Math (15 minutes)

Directions

Note to the Teacher: For the next four lessons, students review mass. Remember that this additional component of Calendar Math should take only a few minutes. It is intended a quick review and refresh for students.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the last five lessons, we reviewed measuring and comparing the lengths of objects. For the next five lessons, we are going to review mass. Remember mass is a measure of how much matter—or stuff—an object has. When we measure mass, we use grams or kilograms. A raisin has a mass of about 1 gram. A bag of rice has a mass of about 1 kilogram.

I have three objects here. I will hold up one object at a time. Clap if you think we would use grams to find the mass. Pop up if you think we would use kilograms to find the mass.

TEACHER DO: Hold up or point to objects. Wait for students to clap or pop up. Call on a student who chose the correct unit of measure to explain their thinking. Repeat for all 3 objects.



STUDENTS DO: For each object, determine which unit of measure should be used. Clap or pop up depending on unit chosen. Selected students explain why they chose the particular unit of measure.

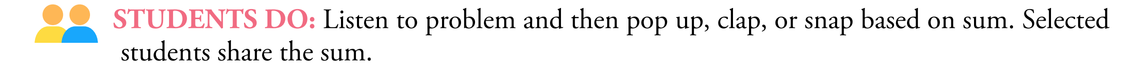
Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students solve math problems that require them to regroup Tens into Hundreds.

1. TEACHER SAY: **Let's play a quick warm-up game called Pop Up/Clap/Snap. I will give you an addition problem. If the sum of the problem is more than 10, pop up. If it is less than 10, clap, and if it is exactly 10, snap. Then I will call on one of you to share the sum. Ready?**

TEACHER DO: Say the following problems:
- 6 + 9
- 3 + 7
- 5 + 2
- 9 + 1
- 7 + 4
- 4 + 4



STUDENTS DO: Listen to problem and then pop up, clap, or snap based on sum. Selected students share the sum.

2. TEACHER SAY: **That was fun. When we add numbers together, sometimes the numbers that need to be regrouped are in the Ones place like the problems we solved yesterday. Let's look at this problem. Raise your hand to share what you see.**

TEACHER DO: Write the following addition problem on the board: 52 + 63 = ______.



STUDENTS DO: Raise hand to volunteer. Selected students share their observations about the problem.

TEACHER DO: If students do not mention regrouping, ask them to think about whether or not regrouping is required to solve the problem.

TEACHER SAY: **The Ones do not need to be regrouped because 2 + 3 is not more than 10. But when we add the Tens together, the sum is more than 10, so we need to regroup the Tens.**

TEACHER DO: Display the large place value mat and have students help you draw place value models for each addend.

Hundreds	Tens	Ones

STUDENTS DO: Selected students help the teacher draw place value models on the place value mat.

TEACHER SAY: **Let's start with the Ones. What is 2 + 3? Show me on your fingers.**



STUDENTS DO: Show 5 on their fingers.

TEACHER SAY: **Right. Now let's add our Tens. Wave if 5 + 6 is more than 10.**



STUDENTS DO: Wave to show 5 + 6 is more than 10.

TEACHER SAY: **Yes, so we need to regroup.**

TEACHER DO: Draw a circle around 10 Tens sticks.

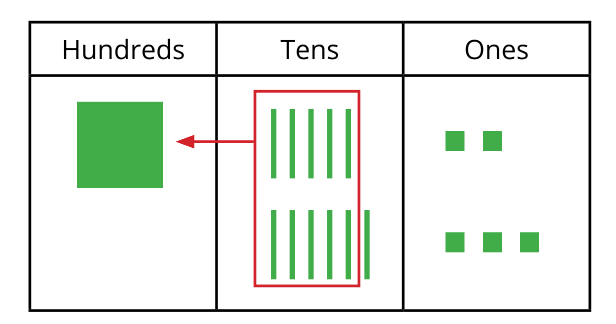
TEACHER SAY: **Do you remember what 10 groups of 10 is? Let's count together. Count aloud as I point.**



STUDENTS DO: Count aloud by tens with the teacher.

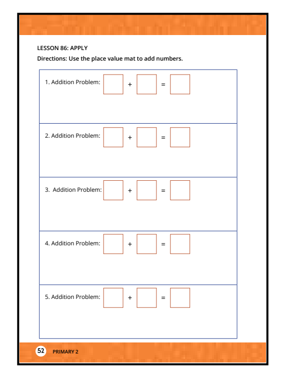
TEACHER SAY: **Great job. 10 sets of Tens is 100. But the Tens place can only hold 9 Tens, so we need to move this new group to the Hundreds place. We can draw a large square to represent one Hundred.**

TEACHER DO: Draw a large square in the Hundreds column to represent one Hundred.



TEACHER SAY: **Now let's find the sum. We have 100 + 10 + 5. That is 115.**

TEACHER DO: Write 115 on the board.



LESSON 86: APPLY

Directions: Use the place value mat to add numbers.

1. Addition Problem: ☐ + ☐ = ☐
2. Addition Problem: ☐ + ☐ = ☐
3. Addition Problem: ☐ + ☐ = ☐
4. Addition Problem: ☐ + ☐ = ☐
5. Addition Problem: ☐ + ☐ = ☐

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3. TEACHER SAY: **Now it is your turn to practice. Take out your Mathematics Student Book and turn to page Lesson 86: Apply.**



STUDENTS DO: Turn to page Lesson 86: Apply in the student book.

TEACHER SAY: **I am going to give you some addition problems. You will work with your Shoulder Partner to solve each problem. You will draw your place value pictures on the mat in your student book. Draw in pencil so you can erase your drawings. For each problem, I will ask some of you to show your work at the board.**

TEACHER DO: Give students two 3-digit numbers to add. Make sure each problem only involves one instance of regrouping. Examples are shown below.

- 264 + 351
- 790 + 150
- 638 + 270
- 477 + 262
- 583 + 365



STUDENTS DO: Work with their **Shoulder Partner** to solve each addition problem. Draw place value models in the student book. Selected pairs show their work on the board and explain how they solved the problem.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on the challenges of regrouping and help each other build understanding.

1. TEACHER SAY: **Today you added two 3-digit numbers that needed to be regrouped in the Tens place. Reflect on your learning. What questions do you still have about regrouping? What is confusing or challenging? What helpful hints have you learned? Think quietly for a moment, and then I will call on some of you to share your thinking.**



STUDENTS DO: Reflect on their learning. Think of questions, challenges, and helpful hints related to regrouping.

TEACHER DO: After about one minute, have students raise their hands to volunteer to share their thinking. Allow students to answer questions and address challenges to help each other learn about regrouping.



STUDENTS DO: Raise hand to volunteer. Selected students share their thinking and help each other build and strengthen their understanding of regrouping.

TEACHER SAY: **That was wonderful. I enjoyed listening to your math thinking and seeing how you help each other. You may put away your student book.**

Lesson 87 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add two 2-digit numbers with regrouping. • Apply mental math strategies to solve an addition problem involving regrouping.	• Review vocabulary as needed.	• Calendar Math area • Objects for measurement review • Large place value mat • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather three objects for measurement review.

Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at three new objects today and decide if we would measure them with grams or kilograms. Clap if you think we would measure the object in grams. Pop up if you think we would measure the object in kilograms. After each object, I will ask one of you to explain why you chose that particular unit of measure.

TEACHER DO: Hold up or point to objects. Wait for students to clap or pop up. Call on a student who chose the correct unit of measure to explain their thinking. Repeat for all 3 objects.



STUDENTS DO: For each object, determine which unit of measure should be used. Clap or pop up depending on unit chosen. Selected students explain why they chose the particular unit of measure.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students solve addition problems, some of which will require them to regroup Tens and Ones. They determine whether or not regrouping is needed and solve the problem accordingly. The continued practice with place value models helps prepare students for learning and using abstract algorithms in coming lessons.

1. TEACHER SAY: **We have learned so much about regrouping the past few days. We have talked about regrouping in the Ones place and we have discussed regrouping in the Tens place. But what if an addition problem requires us to regroup in both the Ones and the Tens places? Let's look at a problem together.**

TEACHER DO: Write 156 + 265 = ______ on the board.

TEACHER SAY: **Which would be the most reasonable estimate for this problem: 200, 400, or 600? Turn and Talk to your Shoulder Partner about which is the most reasonable estimate and why.**



STUDENTS DO: **Turn and Talk** to **Shoulder Partner** about which estimate is the most reasonable and why.

TEACHER SAY: **Let's draw this problem on our place value chart.**

TEACHER DO: Use **Calling Sticks** to select three students to draw a place value model for 156. Have one student draw Hundreds, one draw Tens, and one draw Ones. Offer assistance as needed.

Hundreds	Tens	Ones



STUDENTS DO: Selected students draw place value models for 156 at the board.

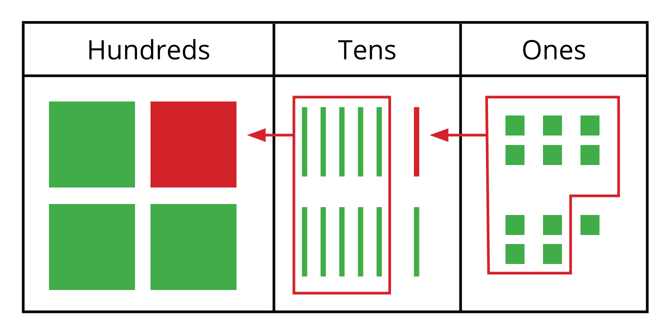
TEACHER DO: Use **Calling Sticks** to select three students to draw a place value model for 265.

Hundreds	Tens	Ones



STUDENTS DO: Selected students draw place value models for 265 at the board.

TEACHER DO: Walk students through regrouping this problem starting with the Ones place. When possible, have students do the work and explain their thinking.



TEACHER DO: Ask students how many Hundreds, Tens, and Ones. Write them on the board. 400 + 20 + 1 = 421.

TEACHER SAY: The sum of 156 and 265 is 421, which is very close to the estimate of 400. We had to regroup in both the Ones and the Tens place to find our answer. Great work, class.

2. TEACHER SAY: Regrouping can be a difficult concept. But the more we practice, the easier it will be for our math brains to regroup numbers. Open your Mathematics Student Book to page Lesson 87: Apply.

 **STUDENTS DO:** Take out Mathematics Student Books and turn to page Lesson 87: Apply.

TEACHER SAY: You are going to work on your own to solve addition problems. Sometimes the problem will require you to regroup Ones. Sometimes the problem will require you to regroup Tens. Some of the problems may not require regrouping at all. So you really have to pay attention and think about what you are doing. Draw place value pictures in the place value mat and record your work in your student book. When you have the answer, raise your hand.

TEACHER DO: Give students an addition problem to solve. Allow time for students to solve the problem, showing work in the student book. Examples are shown below. (It is not necessary to have students solve all six problems.)

- 536 + 25
- 619 + 111
- 73 + 62
- 387 + 426
- 812 + 48
- 47 + 43

 **STUDENTS DO:** Solve the problems given by the teacher, showing their work. Raise hand when finished.

TEACHER DO: Note which students finish first. After most students are finished, have those students share their answers. Have students who get incorrect answers compare their work with their **Shoulder Partner** to identify where they made errors. Have students cheer for each other.

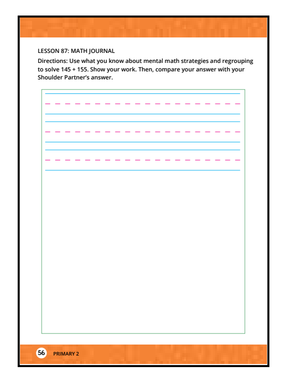
TEACHER SAY: That was so much fun. Give your partner a high five.

 **STUDENTS DO:** Give their partner a high five.

Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students solve a problem where they apply several different addition strategies, such as regrouping, doubles, and doubles plus one. Students solve the problems independently and then compare and discuss their work with their **Shoulder Partner**.



LESSON 87: MATH JOURNAL

Directions: Use what you know about mental math strategies and regrouping to solve 145 + 155. Show your work. Then, compare your answer with your Shoulder Partner's answer.

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1. TEACHER SAY: **Turn to page Lesson 87: Math Journal.**

 STUDENTS DO: Turn to page Lesson 87: Math Journal.

TEACHER SAY: **Today we explored addition problems that required us to regroup in both the Ones and the Tens place. You have also learned many addition strategies this year. As we reflect today, I am going to give you one more regrouping problem to solve. Use what you know about regrouping and mental math strategies like doubles and doubles plus one to solve the problem quickly and correctly.**

TEACHER DO: Write 145 + 155 = _____ on the board.

TEACHER SAY: **Solve this problem in your student book. When you are finished, compare your answer with your Shoulder Partner. Discuss the regrouping and mental math strategies you used.**

 STUDENTS DO: Apply a variety of strategies to solve the problem. Compare answers and the strategies they used with a **Shoulder Partner**.

TEACHER SAY: **You all did a wonderful job today. That was a fun and busy day of math. Please put away your materials and give yourself a pat on the back.**

 STUDENTS DO: Put away materials and give themselves a pat on the back.

Lesson 88 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add 1-, 2-, and 3-digit numbers with and without regrouping. • Use place value models to regroup and add. • Check answers to identify errors and misconceptions.	• Review vocabulary as needed.	• Calendar Math area • Objects for measurement review • Large place value mat • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather three objects for measurement review.

Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at three new objects today and decide if we would measure them with grams or kilograms. Clap if you think we would measure the object in grams. Pop up if you think we would measure the object in kilograms.

TEACHER DO: Hold up or point to objects. Wait for students to clap or pop up. Call on a student who chose the correct unit of measure to explain their thinking. Repeat for all 3 objects.



STUDENTS DO: For each object, determine which unit of measure should be used. Clap or pop up depending on unit chosen. Selected students explain why they chose the particular unit of measure.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students continue to practice adding with regrouping but act as a teacher for each other. Creating problems, solving them, and checking the work of others helps students confirm and expand their own understanding of regrouping and problem solving. This is an important step before they move on to the regrouping algorithm. Students work without you throughout this lesson, so be sure to circulate around the room and observe them as they work and talk.

1. TEACHER SAY: **Let's start math by playing a quick game called Up/Down. I am going to write an addition problem on the board. I want you to look at the numbers. If they need regrouping in the Ones place, pop up. If they need regrouping in the Tens place, crouch down. To play this game, you need to think about why two numbers need to be regrouped. Why would two numbers need to be regrouped?**

 STUDENTS DO: Raise hand to answer. Selected students answer the question.

TEACHER SAY: **That is right. If the sum of two numbers is greater than or equal to 10, it will be necessary to regroup.**

 STUDENTS DO: Play Up/Down by popping up if it is necessary to regroup the Ones and crouch down if it is necessary to regroup the Tens.

TEACHER DO: Write the following addition problems on the board (one at a time) for students to play Up/Down.

- 381 + 494
- 724 + 247
- 555 + 284
- 789 + 174 (This one is meant to cause a discussion. Some students may pop up, some may crouch down, and some may be unsure because it actually requires regrouping of both Ones and Tens.)

2. TEACHER SAY: **Good work. You may sit down. That last one was tricky. Both the Ones and Tens places needed to be regrouped. We saw some problems like this yesterday. We are going to practice this skill some more today, but you are going to be both the teacher and the student. Raise your hand to give me a 3-digit number.**

 STUDENTS DO: Raise hand to volunteer. Selected student gives a 3-digit number.

TEACHER DO: Write the 3-digit number on the board. Have another volunteer give you a 2- or 3-digit number. **Model** how to solve the problem using place value drawings. Do a **Think Aloud** so students understand your problem-solving process. Consider making mistakes as you work to see if students catch them.

TEACHER SAY: **Thank you for your help. Check my answer. Did I get the correct answer?**

 STUDENTS DO: Analyze the teacher's answer and help make corrections, if necessary.

TEACHER SAY: **Wonderful. You are such good teachers. You are going to work with a Shoulder Partner to do exactly what we just did. You will take turns being the teacher and the student. The teacher will make up an addition problem. You can use 1-, 2-, or 3-digit numbers. The student will solve the problem, showing their work. The teacher will then check the work and help the student make corrections, if necessary. Then you will switch roles. The student will become the teacher and the teacher will become the student. Raise your hand if you have a question.**

STUDENTS DO: Raise hand if they have a question.

TEACHER DO: Clarify directions as needed.

TEACHER SAY: **Open your Mathematics Student Book to page Lesson 88: Apply.**


LESSON 88: APPLY

Directions: Write down the problem given by the "teacher." Solve the problem and have the "teacher" check your work. Then switch roles.



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STUDENTS DO: Find page Lesson 88: Apply.

TEACHER SAY: Record and solve your problems on this page. There is a place value mat on the next page where you can draw your place value models. If you would like to use place value straws, there are some available. Just ask. Begin working. You have until the end of Learn time.

STUDENTS DO: Act as a teacher and a student, solving addition problems with and without regrouping with their **Shoulder Partner**.

TEACHER DO: Circulate around the room to listen to students' conversations, check students' work, and offer help as needed. Take note of interesting conversations that may benefit other students. You can ask those students to share their conversation with the class during Reflect. Collect all materials when students are finished.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect today, students discuss the different experiences of thinking about problems as the teacher and as the student.

1. TEACHER SAY: Today you got to be a teacher and a student. Reflect on the experience. How was being the teacher different from being the student? Which experience did you prefer? What did you learn from being the teacher? Think for a moment and then share your thinking with your Shoulder Partner. After a few minutes, I will use Calling Sticks to select some of you to share your thinking with all of us.



STUDENTS DO: Reflect on today's lesson. Consider their responses to the teacher's questions, then share their thinking with their **Shoulder Partner**. Selected students share their thinking with the class.

TEACHER SAY: You shared some very interesting ideas today. Thank you for helping each other learn. Give yourself a pat on the back.



STUDENTS DO: Pat themselves on the back.

Lesson 89 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add 2- and 3-digit numbers with regrouping. • Make connections between concrete and abstract models of regrouping.	• Efficient	• Calendar Math area • Objects for measurement review • Large place value mat • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather/identify 3 objects that measure more or less than 1 kilogram. Students will estimate their relative masses and explain their thinking.

Create and display a large Hundreds–Tens–Ones place value mat.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at three new objects today and estimate whether they measure more or less than 1 kilogram. Stand up if you think it is more than 1 kilogram. Squat down if you think it is less than 1 kilogram.

TEACHER DO: Hold up or point to objects. Wait for students to stand or squat. Call on a student with an accurate estimate to explain their thinking. Repeat for all 3 objects.



STUDENTS DO: For each object, stand if they think the mass is greater than 1 kilogram and squat if they think the mass is less than 1 kilogram. Selected students explain why they chose the particular unit of measure.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students are introduced to an algorithm for adding with regrouping. The problems require regrouping in one place. This lesson helps students begin to make connections between the physical act of regrouping and the abstract algorithm.

This lesson incorporates the computational thinking practice of developing and using abstractions. Students have prepared for this lesson over time by familiarizing themselves with concrete manipulatives and turning them into abstract drawings. They have also practiced regrouping during Calendar Math, though they may not have recognized that they were using the skill of regrouping. Now, students are asked to translate their understanding of these models into an abstract algorithm for adding with regrouping. The algorithm increases efficiency and prepares them for more complex algorithms in later years (without losing "why" of regrouping).

1. TEACHER SAY: **We have been working on adding with regrouping for several days and you are getting very good at it. However, one thing I have noticed is that it takes a lot of time to use straws or draw pictures to solve addition problems and regroup. We need to get more efficient. EFFICIENT means that we work quicker, but still get the correct answer.**

TEACHER DO: Write the following on the board: 136 + 28 = ______. Then write the problem in the large Hundreds–Tens–Ones chart.

	Hundreds	Tens	Ones
	1	3	6
+		2	8

TEACHER SAY: **When I am standing in a store calculating my total, I cannot take out straws or do place value drawings to find the sum. I need a quicker way to solve addition problems with regrouping. Today I am going to show you a shortcut. The process helps us write down what we do when we regroup without using straws or drawings. Where do we begin adding?**



STUDENTS DO: Call out: Ones place.

TEACHER SAY: **Yes, we begin adding in the Ones place. What is 6 plus 8? Raise your hand when you know.**



STUDENTS DO: Raise hand when they have the answer to 6 + 8. Selected student shares their answer.

TEACHER SAY: **Yes, 6 + 8 is 14.**

TEACHER DO: Write 14 in the Ones place as shown below.

TEACHER SAY: **Can we have 14 Ones in the Ones place?**

	Hundreds	Tens	Ones
	1	3	6
+		2	8
			14

STUDENTS DO: Call out: no.

TEACHER SAY: **No, so we have to regroup. How many Tens are in 14? Show me using fingers.**



STUDENTS DO: Hold up 1 finger.

TEACHER SAY: Yes, there is 1 Ten. When we used straws, we took those 10 straws, bundled them together, and moved them to the Tens place. Watch how I do that on the board.

TEACHER DO: **Model** crossing out the 1 in 14 and moving it to the Tens place over the 3. Do a **Think Aloud** so students understand what you are doing and why.

	Hundreds	Tens	Ones
		1	
	1	3	6
+		2	8
			~~1~~4

TEACHER SAY: How many Ones are left? Show me using your fingers.



STUDENTS DO: Hold up 4 fingers.

TEACHER SAY: Yes, there are 4 Ones left. Now let's add the numbers in the Tens place. What is 1 plus 3 plus 2? Raise your hand when you know.



STUDENTS DO: Calculate 1 + 3 + 2 and raise their hand when they know the answer. Selected student shares their answer.

TEACHER SAY: Yes, the sum of 1, 3, and 2 is 6.

TEACHER DO: Write 6 in the Tens place as shown below.

	Hundreds	Tens	Ones
		1	
	1	3	6
+		2	8
		6	~~1~~4

TEACHER SAY: Can we have 6 Tens in the Tens place?

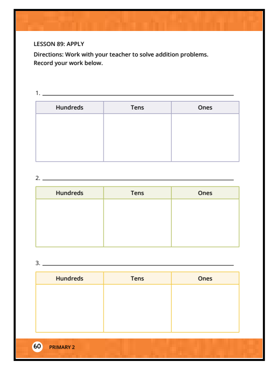


STUDENTS DO: Call out: yes.

TEACHER SAY: Yes, so we do not have to regroup. Now let's add the Hundreds place. We only have 1 Hundred, so I can just write 1 in the answer.

TEACHER DO: Write 1 in the Hundreds place as shown below. Then add the answer to the equation: 136 + 28 = 164.

	Hundreds	Tens	Ones
		1	
	1	3	6
+		2	8
	1	6	~~1~~4


LESSON 89: APPLY
Directions: Work with your teacher to solve addition problems. Record your work below.

1. ______________________

Hundreds	Tens	Ones

2. ______________________

Hundreds	Tens	Ones

3. ______________________

Hundreds	Tens	Ones

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2. TEACHER SAY: What great helpers you are. Now we are going to try some together. Take out your Mathematics Student Book and open it to page Lesson 89: Apply.

 **STUDENTS DO:** Find page Lesson 89: Apply.

TEACHER SAY: There are several Hundreds–Tens–Ones charts in your book. I am going to give you addition problems. You will write them in the place value charts. Then we will work together to solve them. Raise your hand if you have questions.

 **STUDENTS DO:** Raise their hand to ask questions, if necessary.

TEACHER DO: Clarify directions as needed. Write the following problem on the board and in the Hundreds–Tens–Ones chart: 265 + 281 = _____.

TEACHER SAY: Write this problem in your Hundreds–Tens–Ones chart in your book.

 **STUDENTS DO:** Write the addition problem in the place value chart in their book.

TEACHER DO: Work through each step of the problem with students, asking them to help whenever possible. Relate the process of regrouping to the physical models students used. Encourage students to ask questions and help each other build understanding of the operation. Repeat the process for several problems that involve regrouping in one place. Examples are below.

- 362 + 191
- 158 + 26
- 419 + 390
- 47 + 82
- 226 + 281

 **STUDENTS DO:** Work with the teacher to solve each problem. Provide answers and respond to questions when selected. Ask questions and help each other as needed. Record work in the student book.

TEACHER DO: At the end of the Learn segment, have students leave their student books open to today's lesson for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on today's learning and make connections between the operation they learned and the physical act of regrouping.

1. TEACHER SAY: Reflect on the work you did today. How is the work you did in the place value chart like the work you did with straws and drawings? Think quietly for a moment and then share your thinking with your Shoulder Partner. When you are ready to share your thinking with the class, give me a Thumbs Up.

 **STUDENTS DO:** Reflect on learning. Think about the connections between the algorithm and the place value models.

TEACHER DO: As students are talking, listen to their conversations. Take note of students who make accurate and helpful connections so you can call on them to share their thinking with the class. After a few minutes, use an **Attention Getting Signal**. Select students to share their thinking with the class.

 **STUDENTS DO:** Selected students share ideas.

TEACHER SAY: Wow, you are such great mathematical thinkers. I love how you help each other learn. Put away your student book and give your partner a high five. We will continue to work on regrouping in our next math lesson.

 **STUDENTS DO:** Put away materials and give their partner a high five.

Lesson 90 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Identify and correct errors in estimation and regrouping problems. • Add 1-, 2-, and 3-digit numbers with and without regrouping.	• Detective • Error • Estimation • Regrouping	• Calendar Math area • Objects for measurement review • Posters showing "student" work • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create three posters showing "student" work. See Chapter Preparation for the Teacher for instructions and examples.



Calendar Math (15 minutes)

Directions

Note to the Teacher: In this last lesson of the chapter, students complete their review of measurement by determining which unit of measure they would use to find the mass or length of objects.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the past nine lessons, we have reviewed measuring length and mass. For this lesson, I am going to hold up an object and ask a measurement question. You will call out your answer. I will be listening for your answers to see how well you remember what you have learned.

TEACHER DO: Hold up each object and ask a measurement question, such as:
- If I wanted to find the length of this object, what unit of measure should I use?
- If I wanted to find out the mass of this object, what unit of measure should I use?



STUDENTS DO: Call out answers to the teacher's measurement questions.

Learn (40 minutes)

Directions

Note to the Teacher: In this last lesson of the chapter, students become math error detectives. They look at a variety of problems, identify the problems with incorrect answers, and correct the errors. This lesson can serve as an assessment of estimation and regrouping with addition.

Error analysis is an important math and computational thinking skill. When students can find errors in their work or the work of others, it shows they have a firm understanding of the skill or concept.

1. TEACHER SAY: **For the last several days, we have estimated sums and differences and solved a lot of problems using regrouping. You have even written some of your own problems for others to solve. Today we are going to pull that all together and be math detectives. When we are learning, we often make mistakes, and believe it or not, that is good. Being able to find our mistakes and fix them helps us learn faster and better. Turn to your Shoulder Partner and share a time that you might have made a mistake. It can be any kind of mistake. Give me a Thumbs Up if you would like to share with the whole group.**



STUDENTS DO: Discuss with their **Shoulder Partner** a mistake they have made. Give a **Thumbs Up** to share with the large group. Selected students share their stories.

TEACHER DO: Wait 1 to 2 minutes for **Shoulder Partners** to talk, then call on 2 or 3 students with **Thumbs Up** to share their stories.

2. TEACHER SAY: **Great. We all make mistakes in life and in math. Today we are going to work like detectives to look closely at some math problems. Some might have mistakes that we can find and fix and some might not.**

TEACHER DO: Display the posters showing problems 1 and 2. Point to each poster as you discuss it with students.

TEACHER SAY: **I have two problems on the board. Let's be the teacher and check this work together. Each of these posters has a problem and shows the work a student did to solve the problem. Problem 1 asks the student to add 18 and 24. The student drew Tens and Ones and circled a new group of Ten. Their answer is 41.**

Problem 2 asks the student to estimate 76 – 39. The student uses front-end estimation to get 70 – 30. Their estimate is 30.

Turn to your Shoulder Partner and be math detectives. Review both problems and determine whether or not the student's work is correct. If there is a mistake, see if you can you explain what they did wrong. How could they fix their errors? I will use Calling Sticks to choose some students to share.



STUDENTS DO: Turn to **Shoulder Partner** and discuss both examples of "student" work, looking for errors and discussing how to correct them.

TEACHER DO: Call on 2 or 3 students to share what they noticed and how to correct the mistakes. Confirm accurate responses and correct misconceptions.

- Problem 1: The student took 11 Ones to make a new Ten so the answer was incorrect. They can correct it by taking only 10 Ones to make the new Ten, leaving them 2 Ones. The correct answer is 42.
- Problem 2: The student made a calculation mistake. 70 – 30 does not equal 30, but 40. They can correct it by recalculating.

TEACHER SAY: **Nice math detective work. Let's look at one more problem. Put on your math detective hat.**

TEACHER DO: Put up the poster showing problem 3.

TEACHER SAY: **This problem asks the student to round 283 to the nearest Hundred. Work**

with your Shoulder Partner to look at the student's work. Determine if there are errors. If so, how could the student fix their work?

TEACHER DO: Wait 1 to 2 minutes for **Shoulder Partner**s to discuss the problem and answer.



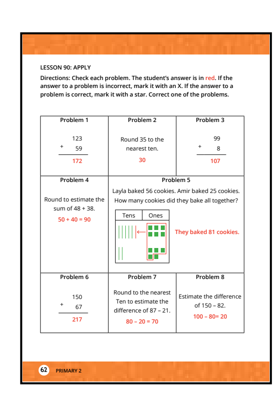
STUDENTS DO: Talk to **Shoulder Partner** about any possible errors.

TEACHER SAY: **Pop up if you found an error. Stay seated if you did not find an error.**



STUDENTS DO: Pop up or stay seated, depending on whether they found an error in the student's work.

TEACHER DO: Call on a student who popped up to explain the error they believe they found. Call on a student who stayed seated to explain why there is no error. Confirm for students that there is no error in the student's work. Their answer is correct.



LESSON 90: APPLY

Directions: Check each problem. The student's answer is in red. If the answer to a problem is incorrect, mark it with an X. If the answer to a problem is correct, mark it with a star. Correct one of the problems.

Problem 1	Problem 2	Problem 3
123 + 59 = 172	Round 35 to the nearest ten. 30	99 + 8 = 107
Problem 4	**Problem 5**	
Round to estimate the sum of 48 + 38. 50 + 40 = 90	Layla baked 56 cookies. Amir baked 25 cookies. How many cookies did they bake all together? Tens / Ones. They baked 81 cookies.	
Problem 6	**Problem 7**	**Problem 8**
150 + 67 = 217	Round to the nearest Ten to estimate the difference of 87 – 21. 80 – 20 = 70	Estimate the difference of 150 – 82. 100 – 80= 20

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3. TEACHER SAY: **Good work. For the rest of the Learn segment, you will continue to be a math detective. Turn to page Lesson 90: Apply in your Mathematics Student Book.**



STUDENTS DO: Turn to page Lesson 90: Apply.

TEACHER SAY: **In your book, there are problems that some students solved. Some have errors and some do not. You will work with a partner to be math detectives and find errors. Place an X by the ones that have errors and a star by the problems that do not have errors. When you are finished identifying which problems have errors and which do not, go back and pick one of the problems with errors and correct it.**

Find a partner using Hands Up, Pair Up. Sit together with your student books and begin your detective work.



STUDENTS DO: Find a partner using **Hands Up, Pair Up**. Work with their partner to examine each problem, placing an X or a star next to them. When finished, fix one of the problems that has errors.

TEACHER DO: Walk around and observe students as they sort, identify errors, and fix a problem. Offer help as needed. Ask some students to justify and explain their thinking. When Learn time is over, use an **Attention Getting Signal**.

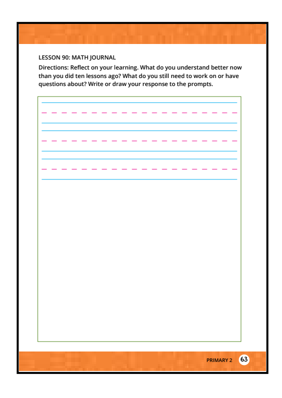
Note to the Teacher: As an extension activity, have students who finish early correct all the problems they marked as having errors.

TEACHER SAY: **Good work being a math detective today. Leave out your student books for Reflect.**



Reflect (5 minutes)

Directions



LESSON 90: MATH JOURNAL

Directions: Reflect on your learning. What do you understand better now than you did ten lessons ago? What do you still need to work on or have questions about? Write or draw your response to the prompts.

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Note to the Teacher: For Reflect, students consider what they have achieved over the last 10 lessons and what they still need to work on.

1. TEACHER SAY: **Turn to page Lesson 90: Math Journal.**

 STUDENTS DO: Turn to page Lesson 90: Math Journal.

TEACHER SAY: **For the last 10 lessons, you have worked hard to learn estimation and regrouping strategies. Today you were math detectives and found errors and fixed them. For Reflect, I want you to think about what you now understand better than you did 10 lessons ago. Think also about what you need to work on or what you still have questions about. Think for a minute and then record your ideas on the Math Journal page.**

 STUDENTS DO: Reflect on learning. Think for a minute and then write or draw a response to the prompts.

TEACHER DO: Give students 3 to 4 minutes to respond to the prompt. As students work, walk around and read some of their entries. Be sure to collect the books to read all of the entries at a later time.

TEACHER SAY: **Thank you for all of your hard work. I am so proud of you. Give your Shoulder Partner a high five and put away your student book.**

 STUDENTS DO: Give their **Shoulder Partner** a high five and put away student books.

PRIMARY 2

Mathematics

COMMUNICATION

Chapter 4

Lessons 91 to 100

Lessons 91 to 100

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 91 to 100, students will work toward the following learning indicators:

B. OPERATIONS AND ALGEBRAIC THINKING:

1.d. Solve addition and subtraction problems within 100 with one unknown in any position within the equation.

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.

2.d. Subtract 1-, 2-, and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.

2.e. Explain why it is sometimes necessary to regroup tens or hundreds to solve problems.

2.f. Use estimation strategies in problem-solving, such as mentally adding or subtracting 10 or 100 (within 1,000).

Computational Thinking

B. OPERATIONS AND ALGEBRAIC THINKING:

1.d. Solve addition and subtraction problems within 100 with one unknown in any position within the equation.

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.

2.d. Add and subtract 1-, 2- and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.

CH 4 Pacing Guide

LESSON	INSTRUCTIONAL FOCUS
91	Students will: • Participate in Calendar Math activities. • Create addition and subtraction sentences using fact families. • Explain the relationship between addition and subtraction.
92	Students will: • Participate in Calendar Math activities. • Use a number line to subtract. • Investigate the relationship between addition and subtraction using a number line.
93	Students will: • Participate in Calendar Math activities. • Solve story problems involving subtraction. • Identify words that signal them to subtract to solve a problem.
94	Students will: • Participate in Calendar Math activities. • Decompose 2-digit numbers into combinations of Tens and Ones. • Explain how decomposing numbers can be helpful.
95	Students will: • Participate in Calendar Math activities. • Apply mental math strategies to subtract by Tens or Hundreds. • Use known subtraction answers to solve new problems.
96	Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2-digit numbers with regrouping. • Define regrouping.
97	Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2-digit numbers with regrouping. • Apply strategies to estimate differences.
98	Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2- and 3-digit numbers with regrouping. • Apply strategies to estimate differences.
99	Students will: • Participate in Calendar Math activities. • Subtract 2- and 3-digit numbers with regrouping. • Make connections between concrete and abstract models of regrouping. • Apply strategies to estimate differences.

LESSON	INSTRUCTIONAL FOCUS
100	Students will: • Participate in Calendar Math activities. • Write addition equations to express the total number of objects in an array. • Design an array using repeated addition.

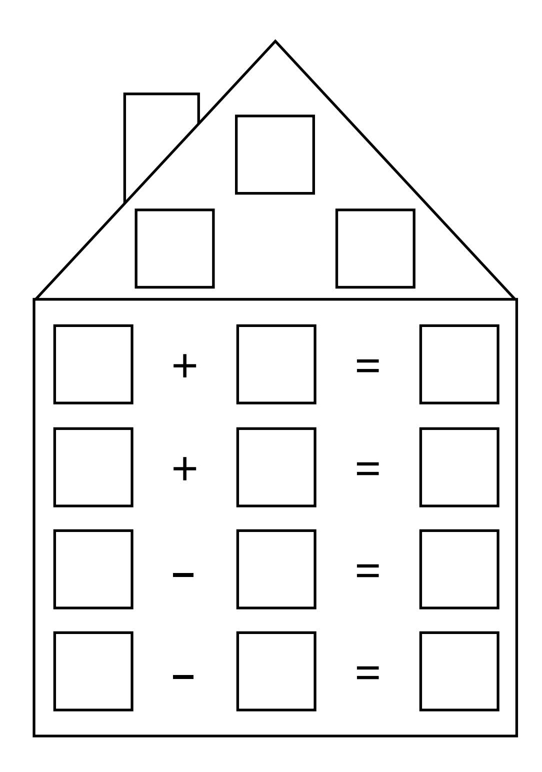
Chapter Preparation for Teacher

Note to the Teacher: On the 100th day of school, students will display collections they have created of 100 items. Since students will need time to assemble 100 items, introduce the assignment in Lesson 91. Consider sending home a letter to families to request their help and support and to invite them to visit on the 100th day. Bring 100 snacks for students and visitors to enjoy.

Encourage students to be creative. For example, students might display a poster of 100 buttons, make 100 bookmarks to share with friends, or create a T-shirt with 100 fish on it.

For Lesson 91:

- Make a large poster of a Fact Family House for display. An example is shown below.
- Print sets of numbers cards 0–9 (one set per pair of students). See the Number Cards 0–9 Blackline Master.



For Lesson 92:

- Cut a piece of string, yarn, or masking tape about 3 meters long. Students will use it as a number line and will stand on it. (Any long line on the floor will work.)
- Make cards (at least 15 cm x 20 cm) with the numbers 8 to 18 on them (one number per card).
- Cut out two red circles at least 15 cm across.

For Lesson 93:

- Have 120 Charts, number lines, and bundled and loose straws or Base Ten blocks available for students to use to solve story problems.

For Lesson 94:

- Gather enough dice for each pair of students to have at least two.
- Have available the place value materials used in Lesson 84.

For Lesson 95:

- Make a poster listing student groups (or write them on the board). Group students so that work can be productive and students can support each other's strengths and challenges.
- Print sets of Cluster Cards (one set per small group). See the Cluster Cards Blackline Master.
    - Put sets in bags or rubber band the cards together so they can be easily stored and reused.

For Lessons 96, 97, and 98:

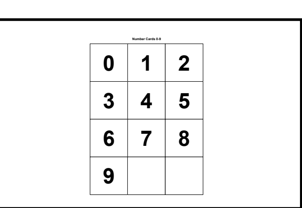
- Create a large Hundreds–Tens–Ones place value mat to model.
- Have available the place value materials used in Lesson 84. Each group needs 20 bundles of 10 and 20 loose sticks. You can use Base Ten blocks if available, but the physical act of unbundling a Ten helps students to conceptualize the abstract process of regrouping.

Materials Used

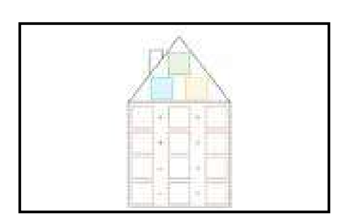
Calendar math area



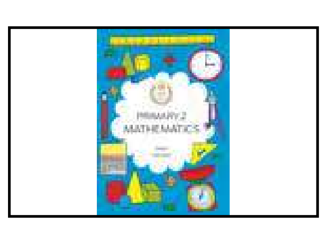
Number cards



Family house poster



Student book



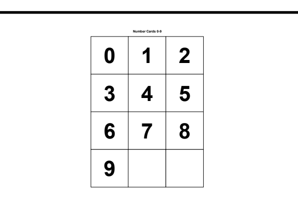
Pencil



Dice



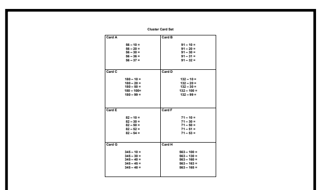
Large numbered cards



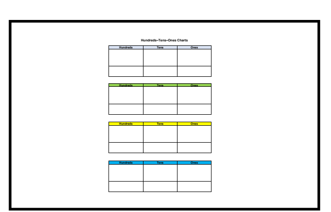
Crayons



Cluster cards



Hundreds, tens, ones chart



Value materials

Small groups poster

Number line

Manipulatives

Lesson 91 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Create addition and subtraction sentences using fact families. • Explain the relationship between addition and subtraction.	• Addend • Fact family • Inverse • Part • Whole	• Calendar Math area • Number cards 0–9 (one set per pair of students) • Fact Family House poster • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a large poster of a Fact Family House for display. See Chapter Preparation for the Teacher for an example.

Print sets of numbers cards 0–9 (one set per pair of students). See the Number Cards 0–9 Blackline Master.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, students review place value concepts and expanded notation. Remember that this additional component of Calendar Math should take only a few minutes. It is intended as quick review of skills and concepts.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the next five lessons, we are going to review place value.

TEACHER DO: Write five numbers on the board: two 3-digit numbers, two 2-digit numbers, and one 1-digit number. Use the same digit in each number. For example: 123; 501; 19; 71; 1. Each day, ask one question about the numbers, such as the following:

- Identify which digit is in all five numbers by holding the digit up on fingers, **Lean and Whisper** or **Turn and Talk**. Then have students identify what the place value of said digit is in each number.
- Practice expanded notation.
- Compare the numbers using < and >.
- Compare the value of the similar digit. For example, the 1 in 123 > than the 1 in 501.



STUDENTS DO: Answer questions about the place value of numbers.

Learn (40 minutes)

Directions

Note to the Teacher: In this chapter, students explore subtraction, ultimately learning to apply the regrouping algorithm in future lessons. However, it is important for students to first have a firm conceptual understanding of what subtraction means. They consider subtraction as comparing two numbers and finding the difference, subtraction as the inverse of addition, and subtraction as taking away. In today's lesson, students review fact families and the relationship between subtraction and addition.

1. TEACHER DO: Post the Fact Family House poster on the board. On the board, write 6, 4, 10.

TEACHER SAY: Today we are going to look at how numbers are related to each other. All year we have been practicing adding and subtracting. Today we are going to investigate how addition and subtraction are connected.

On the board, I have written three numbers. Turn to your Shoulder Partner and talk about how these numbers are related. Can you think of an addition problem that uses all three numbers? Can you think of a subtraction problem that uses all three numbers? In a minute, I will use Calling Sticks to hear what you discussed.

 **STUDENTS DO:** Turn and talk to **Shoulder Partner** about the numbers 6, 4, and 10 and their relationship. If called on, share what they discussed.

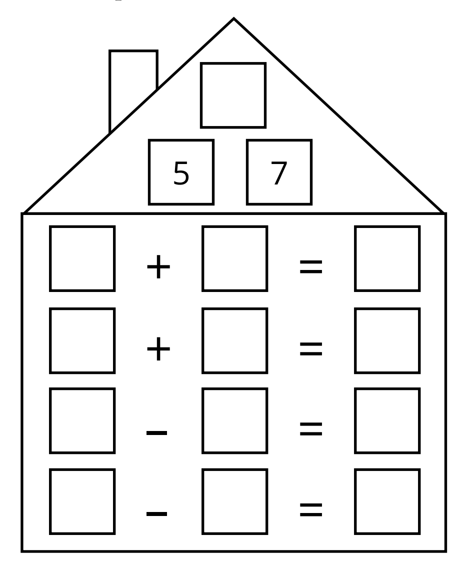
TEACHER DO: Wait about one minute and then use **Calling Sticks** to choose 2 or 3 students to share what they discussed about 6, 4, and 10. If no students share the following, provide the equations to help guide the discussion: $6 + 4 = 10$ and $4 + 6 = 10$; and the inverse, $10 – 6 = 4$ and $10 – 4 = 6$.

TEACHER SAY: Nice work. With these three numbers we could make addition and subtraction sentences. We learned earlier in the year that the addends 6 and 4 can be in any order and we will still get the sum of 10. Also, if we have 10 and take away or subtract 4, we have a difference of 6. If we take 10, and subtract 6, we have 4. This helps us see that addition and subtraction are related to each other. They are the INVERSE, or opposite, of each other, and we can use one to help us with the other. These three numbers are part of a family. Mathematicians call them fact families. Repeat that with me.

 **STUDENTS DO:** Repeat with teacher: fact family.

TEACHER SAY: Let's pick three new numbers for a fact family. I am going to pick two cards. These cards will be our addends, or parts. I am going to record these numbers on my Fact Family House on the board. You will use a similar Fact Family House in your Mathematics Student Book later, so watch me carefully. The two number cards go on the roof in the bottom boxes.

TEACHER DO: Pick two cards and record the numbers in the two boxes at the bottom of the roof triangle. For example, 5 and 7. (Replace 5 and 7 with the numbers you select.)



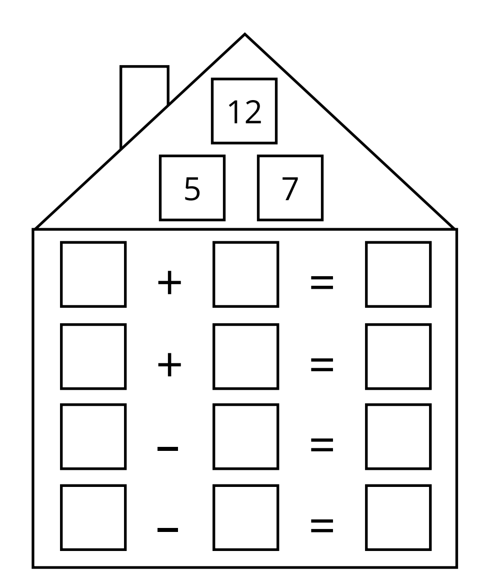
TEACHER SAY: To find our last number in the fact family, we will add these two numbers together. Lean and Whisper the sum.

Note to the Teacher: Another way to do a fact family is to have the largest of the two given numbers be the sum. In the example, the fact family could also be 5, 7, 2 (or 5, 7, 12). If a student comes up with this as a different strategy, celebrate it.

STUDENTS DO: Lean and Whisper the sum.

TEACHER SAY: Great job. Now we have the last number in our family. This family has three numbers: 5, 7, and 12. We had two addends, or parts, 5 and 7, and we found the whole, or the sum. The sum—12—goes at the top of the house and is the largest number. The two addends are the smaller numbers.

TEACHER DO: Record 12 in the top box in the roof triangle so that students can see the three numbers in the fact family.



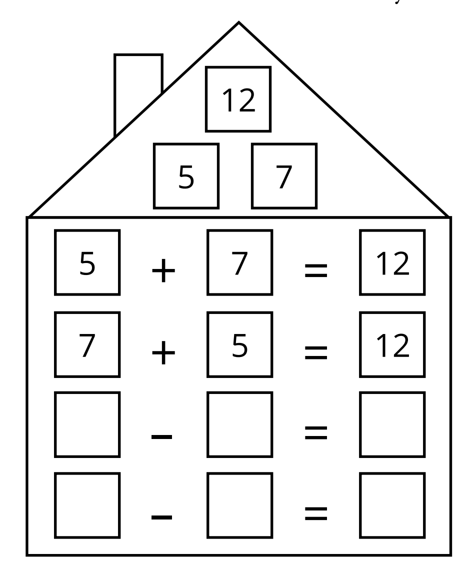
TEACHER SAY: Now that we know the three numbers in this family, we can think about how they are related. Think for a moment and give me a Thumbs Up if you can think of two addition number sentences that can be written using these three numbers.



STUDENTS DO: Think quietly about the numbers. Give a **Thumbs Up** to volunteer. Selected students share an addition problem.

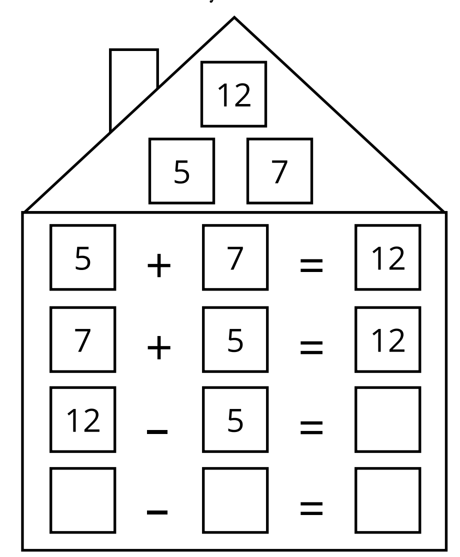
TEACHER SAY: Good work. We can write 5 + 7 = 12 and 7 + 5 = 12. Remember that when we add two numbers, the order does not matter.

TEACHER DO: Write the addition sentences on the fact family house.



TEACHER SAY: Now for the subtraction number sentences. Watch what I write and then give me a Thumbs Up if you know what the missing number should be.

TEACHER DO: Write 12 – 5 in the Fact Family House.



STUDENTS DO: Give a **Thumbs Up** to volunteer. Selected students share their thinking.

TEACHER SAY: Yes, 12 – 5 = 7.

TEACHER DO: Record 7 as the answer to the first subtraction problem.

TEACHER SAY: I could use these addition sentences to help me think of the answer to the subtraction problem. It is the missing part. Knowing that addition and subtraction are related can help us solve 12 – 5.

I have one more question. Look at this last subtraction problem. Clap if you think it is correct and can explain why. Pop up if you think there is an error and can explain why.

TEACHER DO: Write the following in the Fact Family House (be sure you can erase it):

7 – 12 = 5

STUDENTS DO: Clap or pop up. Selected students explain their reasoning.

TEACHER DO: Call on a student who clapped to explain their reasoning. Call on a student standing to explain their reasoning.

Note to the Teacher: This is an opportunity for error analysis as well as a way to help students understand that subtraction does not have a commutative property. The order of numbers in a subtraction equation is important. Error analysis is an important math and computational thinking skill. When students can find errors in their work or the work of others, it shows they have a firm understanding of the skill or concept.

2. TEACHER SAY: Thank you for sharing your thinking. Subtraction is not like addition. The order of the numbers does matter. If I point to you, stand and walk to the front of the room.

TEACHER DO: Point to 7 students.



STUDENTS DO: Selected students stand and walk to the front of the room.

TEACHER SAY: Seven students are standing. If I wanted to take away or subtract 12 students from this group, could I? Could 12 students leave or sit back down? Lean and Whisper your thinking.



STUDENTS DO: Lean and Whisper: no.

TEACHER SAY: Twelve students cannot sit down or leave since we only had 7. Please sit down.

 **STUDENTS DO:** Student helpers sit.

TEACHER SAY: If I point to you, stand and walk to the front of the room.

TEACHER DO: Point to 12 new students.

 **STUDENTS DO:** Selected students stand and walk to the front of the room.

TEACHER SAY: Now I have 12 students. Can 7 students leave or sit back down?

 **STUDENTS DO:** Call out: yes.

TEACHER SAY: Yes, they can. I have enough in the whole group for 7 to leave or sit. Lean and Whisper, how many will be left standing when 7 sit down?

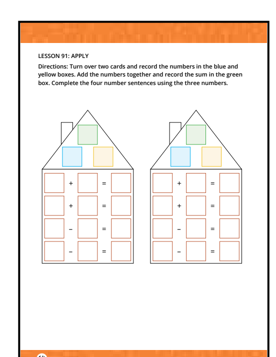
 **STUDENTS DO: Lean and Whisper**: 5.

TEACHER DO: Select 7 students to sit down.

 **STUDENTS DO:** Selected students sit.

TEACHER SAY: Seven students sat down and now we just have 5 left. Again, 5 + 7 = 12, so 12 – 7 will be 5, but the order of the numbers in subtraction equations does matter.

TEACHER DO: Fix the last subtraction problem so it reads 12 – 7 = 5.



3. TEACHER SAY: Now it is your turn. You will work with your Shoulder Partner to make a fact family and then record two addition and two subtraction number sentences for each family. Open your Mathematics Student Book to page Lesson 91: Apply.

 **STUDENTS DO:** Take out student book and turn to page Lesson 91: Apply.

TEACHER SAY: On this page are Fact Family Houses just like the one on the board. You and your partner will get a set of number cards. You will turn over two cards, just as we did together to find the first two numbers. Record the fact family numbers in the roof on the appropriate boxes. Then add those two numbers together to get the third number in the family. Write the sum at the top of the roof. Finally, work together to write four equations, or number sentences, using the fact family numbers. Raise your hand if you have any questions.

 **STUDENTS DO:** Raise hand to ask questions, if needed.

TEACHER DO: Hand out number card sets to each pair of students. Walk around the room, observing students as they work and talk. Note which students are having trouble making the four number sentences.

Note to the Teacher: As an extension activity, have students who finish early think about another way to make a fact family with their two given numbers (see the Note to the Teacher above). Alternatively, you can also create additional problems for students who need support, making the first two addends smaller numbers.

When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: Good work today thinking about how addition and subtraction are related and creating fact families. Return the card sets and keep out your student book for Reflect.

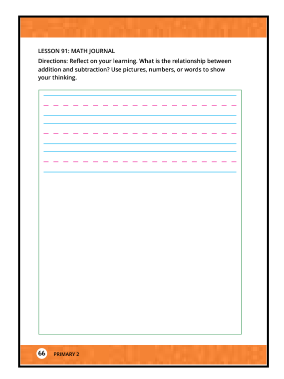
 **STUDENTS DO:** Put away supplies for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students created a fact family and then wrote two addition and two subtraction number sentences. For Reflect, they explain the relationship between addition and subtraction.



1. TEACHER SAY: **Turn to page Lesson 91: Math Journal in your student book.**

 STUDENTS DO: Turn to page Lesson 91: Math Journal in the student book.

TEACHER SAY: **Today we explored the relationship between addition and subtraction by making fact families. On your Math Journal page, please explain the relationship between addition and subtraction. You can use pictures, numbers, or words to share your thinking.**

 STUDENTS DO: Record their thinking.

TEACHER DO: Review some of the students' journal entries as they work. Be sure to review all entries, as the math journal provides valuable information about students' learning.

Lesson 92 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use a number line to subtract. • Investigate the relationship between addition and subtraction using a number line.	• Review vocabulary as needed.	• Calendar Math area • Number line (string, yarn, or masking tape) • Large number cards (8 to 18) • Red crayon or colored pencil (one per student) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Cut a piece of string, yarn, or masking tape about 3 meters long.

Make cards (at least 15 cm x 20 cm) with the numbers 8 to 18 on them (one number per card).

Cut out two red circles (at least 15 cm across).



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Write five numbers on the board: two 3-digit numbers, two 2-digit numbers, and one 1-digit number. Use the same digit in each number. Each day, ask one question about the numbers, such as the following:
- Identify which digit is in all five numbers by holding the digit up on fingers, **Lean and Whisper**, or **Turn and Talk**. Then have students identify what the place value of said digit is in each number.
- Practice expanded notation.
- Compare the numbers using < and >.
- Compare the value of the similar digit.



STUDENTS DO: Answer questions about the place value of numbers.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students use a number line to explore subtraction. Students hop up or hop back, representing adding up or counting back and then write number sentences to represent the hops. The concept of fact families is revisited to reinforce students' thinking about the inverse relationship of addition and subtraction. Students will select a variety of strategies to subtract as they work to develop flexible math strategies, such as counting back, counting on, and physically using the number line.

1. TEACHER DO: Draw an empty number line on the board. Place string on the floor.

TEACHER SAY: Yesterday we investigated fact families and talked about how addition and subtraction are related. You made some fact families and practiced writing addition and subtraction number sentences that were related.

Today we are going to use a number line to investigate subtraction strategies. Number lines are a great tool to help us see the distance between numbers. Let's build one together. I am going to call 10 students to the front. I will give each of you a card with a number on it. Look at your number and put yourselves in order on the line on the floor. Try to build the line without talking. Be sure to space yourselves equally with 8 at one end and 18 at the other end. Hold your number in front of you so everyone can see.

TEACHER DO: Call 10 students to come up and hand out number cards.



STUDENTS DO: Selected students arrange themselves on the line with 8 at one end and 18 at the other, without talking.

TEACHER SAY: Good job. Now that we have our number line, I am going to pick two students and give each a red dot. The first student will stand in front of number 11.

TEACHER DO: Use **Calling Sticks** to select a student. Give the student a red dot.



STUDENTS DO: Selected student stands at 11 on the number line.

TEACHER SAY: The second student will start at 11 and then hop up 6 numbers and stop.

TEACHER DO: Use **Calling Sticks** to select a student. Give the student a red dot.



STUDENTS DO: Selected student starts at 11 and hops 6 numbers.

TEACHER SAY: If we look at the red dots we can see that we started at 11 and then _____ (student's name) hopped 6 hops and landed at 17. What addition problem can we write for what just happened? Share your thinking with your Shoulder Partner. Give me a Thumbs Up when you are ready.



STUDENTS DO: Share their thinking with a **Shoulder Partner**. Give a **Thumbs Up** when they are ready. Selected students share their thinking.

TEACHER DO: Write 11 + 6 = 17 on the board. Then recreate the number line on the board. Circle the 11, draw 6 hops to 17, and circle 17. Then choose two new students to be the dots.

TEACHER SAY: I would like both of you to stand at 17. Then _____ (student's name) is going to hop back to 11. But before _____ (student's name) hops back, give me a Thumbs Up if you have an idea of how many hops it will take and how you know.

STUDENTS DO: Give a **Thumbs Up** to volunteer. Selected students share their thinking and their reasoning.

TEACHER SAY: Let's find out. Count the hops with me.



STUDENTS DO: Helpers stand at 17. Selected student hops back from 17 to 11. Seated students count the hops.

TEACHER SAY: Good job. It took 6 hops to go from 17 to 11. What number sentence can we write to show what was just modeled? Share your thinking with your Shoulder Partner. Give me a Thumbs Up when you are ready.



STUDENTS DO: Share their thinking with a **Shoulder Partner**. Give a **Thumbs Up** when ready. Selected students share their thinking.

TEACHER DO: Write 17 – 6 = 11 on the board.

Note to the Teacher: If time allows, repeat the number line activity with a new problem, linking counting up and counting back as strategies that can be used on the number line. If the first part of this lesson took longer than expected, move on to the next part.

TEACHER SAY: Good. Yesterday we made fact families, and today many of you knew how many hops back from 17 it would take because you thought about 11 + 6 = 17. It helped you think about 17 – 6 = 11. Let's try another one on the board.



STUDENTS DO: Helpers return to their seats.

2. TEACHER SAY: I am going to draw a new number line and write the numbers 8 to 20. Then I am going to write a subtraction number sentence. Use the number line to solve it, and give me a Thumbs Up when you know the answer. I will choose a student to show us on the number line how they found their answer.

TEACHER DO: Write 16 – 5 = _____ on the board. Circle the 16 and the 5.



STUDENTS DO: Solve the subtraction problem. Give a **Thumbs Up** when finished. Selected student shows their work on the board.

TEACHER SAY: Stand if you solved the problem a different way.



STUDENTS DO: Stand if they solved the problem a different way.

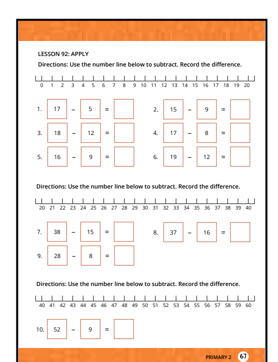
TEACHER DO: Select a student who is standing to show their work on the board.



STUDENTS DO: Selected student shows their work on the board.

TEACHER SAY: Great. This is a subtraction problem, and we are finding the difference between 16 and 5. Some of you might have started at 16 and counted the hops back to 5 on the number line. Some of you might have started at 5 and counted the hops on to 16. No matter what strategy you use, it will take you 11 hops.

TEACHER DO: Use the number line to model as needed. Emphasize the inverse relationship between addition and subtraction.



LESSON 92: APPLY

Directions: Use the number line below to subtract. Record the difference.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1. 17 – 5 =
2. 15 – 9 =
3. 18 – 12 =
4. 17 – 8 =
5. 16 – 9 =
6. 19 – 12 =

Directions: Use the number line below to subtract. Record the difference.

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

7. 38 – 15 =
8. 37 – 16 =
9. 28 – 8 =

Directions: Use the number line below to subtract. Record the difference.

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

10. 52 – 9 =

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3. TEACHER SAY: Let's try some more. Take out your Mathematics Student Book and turn to page Lesson 92: Apply.



STUDENTS DO: Turn to page Lesson 92: Apply.

TEACHER SAY: Use the number lines on this page to solve the subtraction problems. Be sure to record your answers. You may use counting back or counting on or another strategy that works for you. Work independently to solve as many as you can. Use your pencil so you can erase and use the number lines again.



STUDENTS DO: Spend the rest of Learn time solving as many problems as they can in the student book.

TEACHER DO: Walk around and observe students as they work. As an extension activity, have students who finish early select one of the problems and write a story problem for it. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Good work today subtracting using a number line. Put all your supplies away for Reflect.**

 **STUDENTS DO:** Put away supplies.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students used a number line to subtract and reviewed the counting on and counting back strategies. For Reflect, students discuss how they used the number line and when it might not be easy to use a number line (such as with large-number problems.)

1. **TEACHER SAY:** **Today you practiced using a number line to subtract. The number line helps us see the relationship between addition and subtraction. Turn to your Shoulder Partner and talk about how you used the number line today. Did you count on to find the difference or did you count back? When might it be difficult to use a number line? In a few minutes I will use the Calling Sticks to hear from a few of you.**

 **STUDENTS DO:** **Turn and Talk** to **Shoulder Partner** about the questions posed. Selected students share their thinking with the class.

TEACHER SAY: **Great work today subtracting. In our next math lesson, we will solve some story problems. Give your Shoulder Partner a high five.**

 **STUDENTS DO:** Give their **Shoulder Partner** a high five.

Lesson 93 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Solve story problems involving subtraction.
- Identify words that signal them to subtract to solve a problem.

LESSON PREPARATION FOR THE TEACHER

Have 120 Charts, number lines, and bundles and sticks or Base Ten blocks available for students.

KEY VOCABULARY

- Review vocabulary as needed.

MATERIALS

- Calendar Math area
- Manipulatives for students, such as 120 Charts; bundled and loose straws or Base Ten blocks; and number lines
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Write five numbers on the board: two 3-digit numbers, two 2-digit numbers, and one 1-digit number. Use the same digit in each number. Each day, ask one question about the numbers, such as the following:
- Identify which digit is in all five numbers by holding the digit up on fingers, **Lean and Whisper**, or **Turn and Talk**. Then have students identify what the place value of said digit is in each number.
- Practice expanded notation.
- Compare the numbers using < and >.
- Compare the value of the similar digit.



STUDENTS DO: Answer questions about the place value of numbers.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students consider the language of subtraction story problems (for example, less than, difference, how much more? how much less? and left over). They select strategies for solving a variety of story problems working with a partner.

1. TEACHER DO: On the board, write the following story problem: Sara had 58 LE. She spent 22 LE. How many pounds does she have left?

TEACHER SAY: For the past two lessons, we have been thinking about subtraction, fact families, and counting on and back as strategies to help us solve subtraction problems. Today we are going to solve some story problems like the one on the board. Turn to your Shoulder Partner and talk about what equation, or number sentence, you would write to go with this story problem. Give me a Thumbs Up when done.

STUDENTS DO: Turn and talk about the number sentence for the story problem. Give a **Thumbs Up** when done. Selected students share their thinking.

TEACHER DO: Record students' number sentences on the board. 58 – 22; 22 – 58; and 22 + ___ = 58 are possible choices. If students do not suggest one or more of these options, provide them to students and write them on the board.

TEACHER SAY: Let's look at 58 - 22. How can we tell that this story problem matches that number sentence? Are there any words in the problem that give a clue that we should subtract? Give me a Thumbs Up if you would like to circle any words that tell us we should subtract.



STUDENTS DO: Give a **Thumbs Up** to volunteer. Selected students share their thinking and circle words that tell them they should subtract.

TEACHER DO: As they circle words, ask students how the words suggest that the operation is subtraction. (For example: Spending means giving away. How many are left means that something was used and something still remains.)

TEACHER SAY: Usually when we subtract, we take out a quantity. We find the spaces on the number line between the two amounts. Words like "spent" or "gave" tell us that something is being taken from a whole. Questions like "How many are left?" also give us a clue that something was taken from the whole and something is left over. Why can we not write 22 - 58 to solve this problem? Raise your hand to explain.



STUDENTS DO: Raise hand to volunteer. Selected students share their thinking.

TEACHER SAY: Yes, remember that with subtraction, the order matters. Sara did not start with 22 pounds and spend 58. She started with 58 and subtracted 22. That is an important part of solving story problems—figuring out what is happening in the story and determining the order of the numbers in your equation. If it is an addition problem, the order does not matter, but with subtraction it does.

2. TEACHER DO: Write the following story problem on the board: Farah has 58 apples. Amir has 22 apples. How many more apples does Farah have?

TEACHER SAY: How is this problem different from the last one? How is it the same? Turn and Talk to your Shoulder Partner about how this problem is different and the same and how you might solve it. Give me a Thumbs Up when you are ready to share your thinking.



STUDENTS DO: Turn and Talk to their **Shoulder Partner** about how this problem is different from and the same as the first problem. Give a **Thumbs Up** when ready. Selected students share their thinking and how they would solve the problem.

TEACHER DO: Take note of the strategies students propose. Correct any misconceptions.

TEACHER SAY: Good ideas. In the last problem, someone had 58 pounds and they gave some away. In this one, Farah has some apples and so does Amir. We are asked who has more. Nothing is given away, spent, or taken. Instead, this problem is comparing Farah's quantity to Amir's quantity. To compare, we could subtract 22 from 58 to see how many more apples Farah has. Comparing quantities is often seen as a subtraction. Does anyone have a way they could compare the apples and not subtract? Raise your hand.



STUDENTS DO: Raise hand to volunteer. Selected students share another strategy that is not subtraction.

TEACHER SAY: Nice work. You could compare the apples by adding up from Amir's apples to Farah's apples. Remember from our fact family work that addition and subtraction are opposites. We could solve this problem as 58 - 22 = something or as 22 + something = 58. We can take away or add up.

TEACHER DO: Record both number sentences on the board. Circle the phrase "How many more?"

TEACHER SAY: In this second story problem, the words that helped me think about how to solve were the words "How many more?" This is a clue that tells me I am comparing the two quantities of apples, and comparisons can be done using subtraction. Both of these story problems use the same numbers and can be solved with subtraction.

Turn to your Shoulder Partner and think of a different story problem that would still use 58 - 22. Give me a Thumbs Up when you are ready.



STUDENTS DO: Work with **Shoulder Partner** to think of a story problem. Give a **Thumbs Up** to share. Selected students share their story problem.

TEACHER DO: Most of them will likely sound similar to the original problem, but that is all right for now. As students share their problems ask them to identify what words they used that would help others know to subtract. How do the words help them understand what is happening?

TEACHER SAY: Great story problems. Before we find the difference between 58 and 22, let's estimate. What is a reasonable estimate for 58 - 22? You can use the rounding strategy or the front-end estimation strategy. Turn and Talk to your Shoulder Partner and give me a Thumbs Up when done. Remember, an estimate is just a close value, not the exact value.



STUDENTS DO: Turn and Talk to **Shoulder Partner** and estimate the difference between 58 and 22. Give a **Thumbs Up** when done. Selected students share their estimates.

TEACHER SAY: Good. With front-end estimation, this problem would be 50 - 20, and the estimated difference would be 30. If we rounded the two numbers to the closest Ten, we would have 60 - 20, for an estimated difference of 40. Estimation is helpful because it gives us an idea what the exact answer will be. We estimate that the difference should be between 30 and 40. Now work with your **Shoulder Partner** to find the exact difference. You can draw a place value picture or ask for bundles and sticks. Give me a **Thumbs Up** when done.



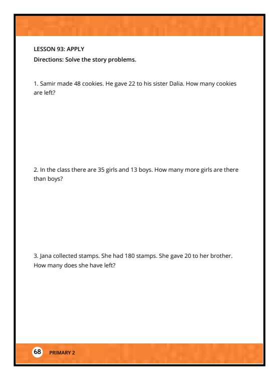
STUDENTS DO: Work with their **Shoulder Partner** to solve 58 – 22. Give a **Thumbs Up** when done. Selected students share their answer.

TEACHER SAY: Great. 58 - 22 = 36. Our estimate was between 30 and 40, so our answer of 36 is reasonable. In the first problem, Sara has 36 pounds left. In the second problem, Farah has 36 more apples than Amir. Now let's practice some more. Take out your Mathematics Student Book and a pencil and turn to page Lesson 93: Apply.



STUDENTS DO: Turn to page Lesson 93: Apply.

3. TEACHER SAY: In your student book, there are some story problems. You will work with a partner to read them and decide how to solve them. As you are reading them, you can circle words that might help you understand how to solve, just as we did with the two problems on the board. Let's do Hands Up, Pair Up to find a partner today. Take your student book and pencil with you.



LESSON 93: APPLY

Directions: Solve the story problems.

1. Samir made 48 cookies. He gave 22 to his sister Dalia. How many cookies are left?

2. In the class there are 35 girls and 13 boys. How many more girls are there than boys?

3. Jana collected stamps. She had 180 stamps. She gave 20 to her brother. How many does she have left?

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STUDENTS DO: Use **Hands Up, Pair Up** to find a partner. Work together to read and solve the story problems in their student book.

TEACHER DO: Walk around and observe students as they work together to solve story problems. All of them can be solved using subtraction, but some students may choose to add up. Also, none of these problems require regrouping but have bundles and sticks available as well as 120 Charts and number lines if needed. As an extension activity, have students who finish early write subtraction story problems for each other to solve. Use an **Attention Getting Signal** when Learn time is over.

TEACHER SAY: Great work today reading and thinking about how to solve some story problems.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students solved story problems involving subtraction. During Reflect, they talk to their **Shoulder Partner** *about how they solved the problems and compare their answers.*

1. TEACHER SAY: Today we solved story problems and identified some of the language that helps us know that we need to subtract. For Reflect, turn to your Shoulder Partner and share your Apply page. Compare your answers and talk about how you solved each one.



STUDENTS DO: Share Apply page with **Shoulder Partner** to compare answers and strategies.

TEACHER DO: Give students 2 to 3 minutes talk with their **Shoulder Partner**. If time allows, use **Calling Sticks** to choose two to four students to share what they discussed with their partner.

TEACHER SAY: Put away your student book for today and thank your Shoulder Partner.



STUDENTS DO: Put away book and thank their **Shoulder Partner**.

Lesson 94 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Decompose 2-digit numbers into combinations of Tens and Ones.
- Explain how decomposing numbers can be helpful.

KEY VOCABULARY

- Decompose
- Decomposing

MATERIALS

- Calendar Math area
- Dice (at least 2 per pair of students)
- Place value materials from Lesson 84
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather enough dice for each pair of students to have at least two.

Have available the place value materials used in Lesson 84.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Write five numbers on the board: two 3-digit numbers, two 2-digit numbers, and one 1-digit number. Use the same digit in each number. Each day, ask one question about the numbers, such as the following:
- Identify which digit is in all five numbers by holding the digit up on fingers, **Lean and Whisper**, or **Turn and Talk**. Then have students identify what the place value of said digit is in each number.
- Practice expanded notation.
- Compare the numbers using < and >.
- Compare the value of the similar digit.



STUDENTS DO: Answer questions about the place value of numbers

Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students investigate ways to decompose and compose numbers. For example, 34 can be decomposed into 30 + 4 or 20 + 14, and so on. Decomposing numbers helps students build an understanding of regrouping with subtraction in later lessons. Students need to understand that then when they regroup to get a new Ten, the quantity is not changing, just the way the number is decomposed. Additionally, breaking down numbers and problems into smaller parts is an important part of computational thinking.

1. TEACHER DO: Write 34 = 30 + 4 on the board. Have place value materials from Lesson 84 available to help model.

TEACHER SAY: Today we are going to look at how we can break numbers into smaller parts. A great math vocabulary word for that is DECOMPOSING. We learned that word earlier this year. We can DECOMPOSE numbers to make them easier to work with.

On the board is the number sentence 34 = 30 + 4. 34 is decomposed into two smaller addends—30 and 4, Tens and Ones. Turn to your Shoulder Partner and see if you can think of two or three more ways to break apart 34 into two or more smaller addends. There are many possible answers. Think about combinations of Tens and Ones. After a couple of minutes, I will use Calling Sticks to hear some of your ideas.

 **STUDENTS DO:** Turn to their **Shoulder Partner** and think of ways to break apart 34.

TEACHER DO: Use **Calling Sticks** to choose 2 to 4 students to share how they decomposed 34. Record their ideas on the board. If no one shares 34 = 10 + 10 + 10 + 4 or 34 = 20 + 14, write them on the board.

Note to the Teacher: If a student says a combination similar to 30 + 2 + 2, acknowledge that it also totals 34, but focus mostly on the combinations that include multiples of 10 and extra ones.

TEACHER SAY: There are many ways to break apart, or decompose, this number. Let's look at 34 = 20 + 14 and 34 = 10 + 10 + 10 + 4. Raise your hand if you can explain how both of these number sentences equal 34.

 **STUDENTS DO:** Raise hand to volunteer. Selected students share their thinking.

TEACHER SAY: Great work. 20 + 14 decomposes 34 into 2 Tens and 14 Ones, and 10 + 10 + 10 + 4 decomposes 34 into 3 Tens and 4 Ones. We have decomposed 34 in different ways, but the value is still the same. Also, in all of these problems, I recorded the whole, or the total, first and then the number sentence. Is 34 = 30 + 4 the same as 30 + 4 = 34? Give me a Thumbs Up to share your thinking.

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share their thinking.

2. TEACHER SAY: Yes, a number sentence can have the whole (sum) written first, the equal sign, and the parts (addends) next or the addends first and the sum last. It does not matter. The equal sign just tells us that both sides have the same value. This is important in math and we will talk about it more later, but I wanted you to know that you can see number sentences written both ways.

Let's look at a different problem. Turn to a Shoulder Partner and discuss what the missing addends would be to make these number sentence true. After a minute, I will use the Calling Sticks to choose some of you to share.

TEACHER DO: Write the following on the board:
87 = 80 + ________.
87 = 70 + ________.
_______ + 27 = 87

Allow a minute for students to talk and then use **Calling Sticks** to choose students to share.



STUDENTS DO: Talk to **Shoulder Partner** about the missing addends. Selected students share missing addends.

TEACHER SAY: Good. Each of these problems had a missing addend. All of them equal 87. We just decomposed 87 in different ways. I can show that with my straws.

TEACHER DO: Model 87 as 8 bundles of 10 and 7 loose sticks.

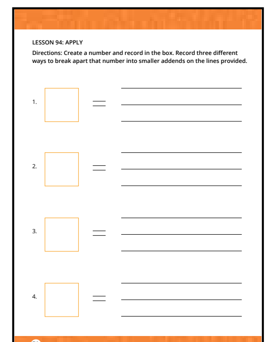
TEACHER SAY: I have 8 Tens and 7 Ones. If I move one of these bundles of Ten to the Ones, I still have the same amount of sticks (87) but now there are 70 (7 bundles) and 17 (the bundle of Ten and the 7 loose sticks).

TEACHER DO: Model moving a bundle of Ten to the Ones.

TEACHER SAY: I can then move another bundle of Ten and have 60 and 27.

TEACHER DO: Model moving another bundle of Ten to the Ones.

3. TEACHER SAY: The total quantity of 87 is not changing. I am just decomposing 87 into different smaller parts. Today we are going to practice this concept of breaking numbers apart into smaller parts. Take out your Mathematics Student Book and turn to page Lesson 94: Apply.



LESSON 94: APPLY

Directions: Create a number and record in the box. Record three different ways to break apart that number into smaller addends on the lines provided.

1. ☐ =

2. ☐ =

3. ☐ =

4. ☐ =

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STUDENTS DO: Take out Mathematics Student Book and find page Lesson 94: Apply.

TEACHER SAY: For this activity, you are going to roll dice to make a number. Then you and your Shoulder Partner will find two or three ways to decompose the number—or break it apart—into smaller parts. Make sure you record your work in your student book. Let's do one together. The first roll is the Tens digit and the second roll is the Ones digit. I will record my work on the board. You record your work in your book.

TEACHER DO: Roll the dice and record the number created.



STUDENTS DO: Record the teacher's 2-digit number in the student book.

TEACHER SAY: Work with your Shoulder Partner to find two or three ways to break this number up into smaller parts. Think about combinations of Tens and Ones. Give me a Thumbs Up when done.



STUDENTS DO: Work with their **Shoulder Partner** to decompose the given number. Give a **Thumbs Up** when done.

TEACHER SAY: Let's hear some of the ways you broke up _____ (number).

TEACHER DO: Call on students with **Thumbs Up** and record their work. If necessary, model a decomposition of the number showing Tens and Ones.

Note to the Teacher: Decomposing numbers in this way lays the groundwork for the regrouping students will do later, so be sure they are thinking about decomposition as creating various combinations of Tens and Ones.

4. TEACHER SAY: Good work. Now you are on your own. I will bring you and your partner dice. Roll the dice and record your number. Then work together to find two or three ways to break apart your number. There are enough spaces in your book for you to do four problems. If you want to use them, you may get place value straws to work with.

TEACHER DO: Hand out two dice to each pair of students.



STUDENTS DO: Spend the rest of Learn time creating and decomposing numbers.

TEACHER DO: Walk around and observe students as they create and decompose numbers. Offer concrete manipulatives to help students decompose.

Note to the Teacher: As an extension activity, give a third die to students who finish early. Have them create and decompose 3-digit numbers.

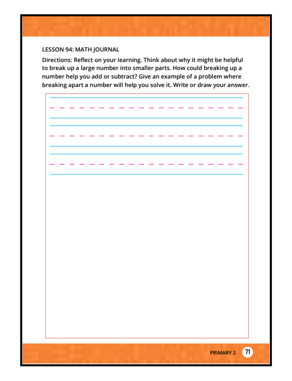
TEACHER SAY: **Good work today decomposing numbers. Put away your supplies but keep out your student book.**



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students write about why it might be helpful to be able to break apart numbers into different combinations.


LESSON 94: MATH JOURNAL

Directions: Reflect on your learning. Think about why it might be helpful to break up a large number into smaller parts. How could breaking up a number help you add or subtract? Give an example of a problem where breaking apart a number will help you solve it. Write or draw your answer.

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1. TEACHER SAY: **Turn to page Lesson 94: Math Journal in your student book.**

STUDENTS DO: Turn to page Lesson 94: Math Journal in their book.

TEACHER SAY: **Today we practiced breaking apart—or decomposing—numbers into smaller addends. For Reflect, I want you to think about why it might be helpful to break up a large number into smaller parts. Could it help you add or subtract? How? Give an example. Record your thinking in your student book.**

STUDENTS DO: Think for a minute and then write or draw a response to the prompt in their student book.

TEACHER DO: As students work, walk around and read some of their entries. This is a challenging topic, but the prompt will provide valuable insight into students' thinking. Be sure to read all entries at a later time. After about 4 minutes, use an **Attention Getting Signal**.

TEACHER SAY: **Great work today. Put away your pencil and student book and give yourself a pat on the back.**



STUDENTS DO: Put away pencil and book and give themselves a pat on the back.

Lesson 95 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Apply mental math strategies to subtract by Tens or Hundreds. • Use known subtraction answers to solve new problems.	• Cluster problem	• Calendar Math area • Poster of small groups (or a list on the board) • Sets of Cluster Cards (one set for each group of four or five students) • Place value materials from Lesson 84 • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a poster listing student groups (or write them on the board). Plan to put 4 or 5 students in each group.

Print sets of Cluster Cards (one set per small group). See the Cluster Cards Blackline Master.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER DO: Write five numbers on the board: two 3-digit numbers, two 2-digit numbers, and one 1-digit number. Use the same digit in each number. Each day, ask one question about the numbers, such as the following:

- Identify which digit is in all five numbers by holding the digit up on fingers, **Lean and Whisper**, or **Turn and Talk**. Then have students identify what the place value of said digit is in each number.
- Practice expanded notation.
- Compare the numbers using < and >.
- Compare the value of the similar digit.



STUDENTS DO: Answer questions about the place value of numbers.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students solve a cluster of problems that are related. Finding the answer to the first problem should help students find the answer to the second problem, and so on. The objective is for students to use mental math strategies to calculate the answers. The last problem in the cluster may require regrouping, but students should be able to find the difference mentally from the previous problems. This exercise leads into Lesson 96, where regrouping with subtraction is introduced. It is important to continue to ask students to think about what they know when subtracting and continually making the link for them back to fact families and the inverse relationship of addition and subtraction.

1. TEACHER DO: Write the problems below on the board. These are cluster problems. Cluster problems are sets of three or more problems that use known facts from the first problems to answer a more difficult problem.

94 – 10 = ______
94 – 20 = ______
94 – 40 = ______
94 – 44 = ______

TEACHER SAY: **On the board are four problems. This is called a cluster problem. They are a cluster of problems that are related. Each problem is kind of like a key that unlocks the solutions to the others. Turn to your Shoulder Partner and see if you can mentally solve each problem. Discuss how each problem is related to the one before it. Give me a Thumbs Up when you are finished. I will give you a couple minutes.**

 **STUDENTS DO:** Work with their **Shoulder Partner** to mentally solve the cluster problems. Give a **Thumbs Up** when finished.

TEACHER DO: Wait about 2 minutes for **Shoulder Partners** to finish and give a **Thumbs Up**.

TEACHER SAY: **As I state each problem, Lean and Whisper the difference.**

TEACHER DO: Point to and read each problem one at a time Record students' (correct) responses.

 **STUDENTS DO:** **Lean and Whisper** the difference for each problem.

TEACHER SAY: **Great. The first three problems are just subtracting groups of 10. Remember when we subtract 10s, the digit in the Ones place remains the same and the digit in the Tens place increases or decreases. The fourth problem is subtracting Tens and Ones. Raise your hand if you can explain how solving the third problem can help you solve the fourth.**

 **STUDENTS DO:** Raise hand to volunteer. Selected students discuss how solving 94 – 40 can help with solving 94 – 44.

TEACHER DO: Write 94 – 45 on the board.

2. TEACHER SAY: **Good. I have now written one more problem on the board. Look at this last one and Lean and Whisper what you think the difference might be.**

 **STUDENTS DO:** **Lean and Whisper**: 49.

TEACHER SAY: **Give me a Thumbs Up if you would like to explain how you knew that 94 - 45 would have a difference of 49. How can 94 - 44 help solve 94 - 45?**

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share their thinking.

TEACHER SAY: **Good. 94 - 44 = 50, so when we take 1 more away—45—our answer should be one less than 50, or 49.**

TEACHER DO: Use a number line or the 120 Chart to explain.

TEACHER SAY: When we hopped back 44, we landed at 50. If we hopped or counted back 45—one more hop than 44, we would land at 49.

Note to the Teacher: Some students may want to count up from 44, which was modeled in Lesson 92, or they may want to hop back 40 right to 54. If that comes up, discuss it. However, based on the cluster problems, most students will just continue to take off groups of 10 from one problem to the next. The number line and 120 Chart are just visual models of what they are doing mentally.

3. TEACHER SAY: Okay, let's try one more cluster problem set together. After I write the set, I will point to each problem and you will Lean and Whisper the difference.

TEACHER DO: Write the following cluster of problems on the board:
150 – 10 = ______
150 – 20 = ______
150 – 50 = ______
150 – 100 = ______

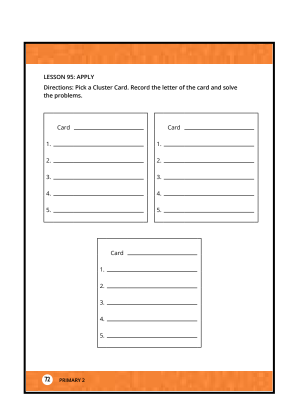
Point to each problem and record what the students **Lean and Whisper**.



STUDENTS DO: Lean and Whisper: 140, 130, 100, 50.

TEACHER DO: Add 150 – 99 = ______ to the list. Ask students to **Lean and Whisper** the difference. If necessary for your group of students, repeat the number line process from above with 150 – 100 and then 150 – 99.

4. TEACHER SAY: Great job. 150 - 99 will be one less than 150 - 100, so the difference is 51.


LESSON 95: APPLY

Directions: Pick a Cluster Card. Record the letter of the card and solve the problems.

Card ______
1. ______
2. ______
3. ______
4. ______
5. ______

Card ______
1. ______
2. ______
3. ______
4. ______
5. ______

Card ______
1. ______
2. ______
3. ______
4. ______
5. ______

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Now it is your turn to work on some cluster problems in a small group. Take out your Mathematics Student Book and turn to page Lesson 95: Apply.



STUDENTS DO: Open their Mathematics Student Books to page Lesson 95: Apply.

TEACHER SAY: Each group will get a set of Cluster Cards. Try and solve the problems on the cards independently, but your group is there to support you if needed. Also, if another person in your group has completed the same card as you, you can check your work together.

Each card has a letter. Record the letter and the answers to the subtraction problems. On the board is your group.

TEACHER DO: Show a card and the Apply page. Point out the groups for students to see and direct students to find their groups and sit together.



STUDENTS DO: Find group and sit together.

TEACHER DO: Hand out Cluster Card sets.



STUDENTS DO: Work for the rest of Learn time on the Cluster Card activity. Record card letter and differences in student book. Check with others in the group to see if their answers are similar.

Note to the Teacher: The Cluster Cards are differentiated slightly. Cards A to D start with subtracting 10 and progress in a pattern similar to the cluster problems modeled. Cards E to H start with subtracting 10 or 100, vary in between, and end with students having to find a difference 2 or 3 from the previous problem. Card H requires subtracting Hundreds and Tens, so it is the most challenging card. This was not modeled during the lesson, but students who understand the process and how the clusters work may tackle this challenge. For students who are struggling, provide 120 Charts or number lines or place value manipulatives to support their understanding.

TEACHER DO: Walk around and observe students as they solve the problems. Offer help as needed. When Learn time is over, use an **Attention Getting Signal**.

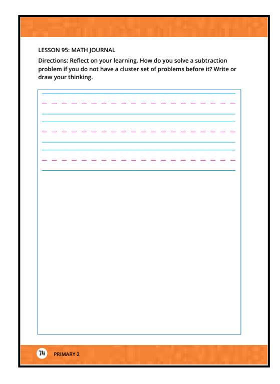
TEACHER SAY: I saw so much great work today. Return your cards to me and return to your seat for Reflect. You will need your student book.

 **STUDENTS DO:** Return supplies and return to seat.



Reflect (5 minutes)

Directions



LESSON 95: MATH JOURNAL

Directions: Reflect on your learning. How do you solve a subtraction problem if you do not have a cluster set of problems before it? Write or draw your thinking.

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Note to the Teacher: For Reflect, students think about how they might solve a problem that uses regrouping if they did not have a cluster to guide them.

1. TEACHER SAY: Turn to page Lesson 95: Math Journal in your student book.

 **STUDENTS DO:** Turn to page Lesson 95: Math Journal in their book.

TEACHER SAY: Today we explored cluster problems and used the answer to each problem as a key to help us unlock the answer to the next problem. Most of them were subtracting groups of 10 or 100, but the last problem asked us to think about subtracting Tens and Ones. We used the previous problem to help mentally solve the last one. For example, 93 - 33 = 60, so 93 - 34 would equal 59. But how could you solve 93 - 34 if you did not have a helper problem before it? What strategy would you use to find the difference? Think for a minute and then write or draw your thinking in your book.

 **STUDENTS DO:** Think for a minute and then write or draw a response to the prompt in their student book.

TEACHER DO: Give students 1 to 2 minutes to respond to the prompt. Be sure to take the time to read all of the students' reflections to see how they are thinking about subtraction strategies prior to Lesson 96.

TEACHER SAY: Great work today. You did a wonderful job using cluster problems to solve new problems. In our next math lesson, you will learn how to solve some subtraction problems using regrouping, which we learned with addition already. Put away your student books and pencil.

 **STUDENTS DO:** Put away their book and pencil.

Lesson 96 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2-digit numbers with regrouping. • Define regrouping.	• Review vocabulary as needed.	• Calendar Math area • Large Hundreds–Tens–Ones place value mat • Place value materials from Lesson 84 • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create a large Hundreds–Tens–Ones place value mat to model.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, students begin reviewing shape attributes and continue this topic of review for the next four lessons. This will help support the fraction work that will happen in the next chapter. Remember that this additional component of Calendar Math should take only a few minutes. It is intended as a quick review of concepts for students.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the last five lessons, we reviewed place value concepts. For the next five lessons, we are going to review some two-dimensional shapes and their attributes, or characteristics. I will draw four shapes for us to discuss today.

TEACHER DO: Draw or post four different two-dimensional shapes on the board. Use a variety of shapes each day, including triangles, quadrilaterals, pentagons, and hexagons. It is okay to have two different types of triangles in the same day or two different quadrilaterals.

- Using **Calling Sticks**, choose students to do one or more of the following:
- Identify the four shapes.
- List the numbers of sides and vertices of each shape.
- Compare the shapes. Are there similar shapes—two different quadrilaterals or two different triangles?
- Sort the shapes by characteristics.

- Draw a different shape that has similar characteristics. For example, if a rectangle is drawn, have students draw a different quadrilateral with four sides and four vertices.
- Discuss if a shape can be cut into two smaller shapes. (A rectangle or square can be made into two triangles; a regular hexagon can be cut into two trapeziums or six triangles.)

 **STUDENTS DO:** Selected students answer questions about shapes.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students use straws (bundled and loose) along with place value mats to subtract with regrouping. The students physically ungroup a bundle of Ten to make 10 Ones. This builds the foundation for students to understand regrouping. Students practice regrouping in small groups.

Using models and place value to solve problems helps students develop and use abstractions, an important practice in computational thinking. Provide multiple opportunities for students to explore the use of physical models and place value drawings. Consider setting up a math center with materials and practice problems. If possible, include an answer key so students can check and correct their own work. Many students will find the extra independent practice (without the pressure of peers or having their work scored) valuable.

1. TEACHER DO: Write the following cluster problem on the board:
150 – 10 = ______
150 – 20 = ______
150 – 50 =______
150 – 100 = ______
150 – 99 = ______

TEACHER SAY: Turn and Talk to your Shoulder Partner about what you remember about cluster problems. How do cluster problems help us?

 **STUDENTS DO:** **Turn and Talk** to **Shoulder Partner** about what they learned about cluster problems.

TEACHER SAY: When we solved this cluster problem in our last math lesson, it was easy to solve each problem because we could use the answers we had already figured out to solve the new problems.

TEACHER DO: Write the answers on the board as you do a **Think Aloud** for each problem.

TEACHER SAY: We know that 150 - 10 = 140; 150 - 20 = 130; 150 - 50 = 100; and 150 - 100 = 50. Without these answers, the final problem, 150 - 99, is challenging because when we go to solve it, we find that in the Ones place we have 0 - 9. Let's pretend these are cookies. Can you eat 9 cookies if there are 0 on the plate?

 **STUDENTS DO:** Call out: no.

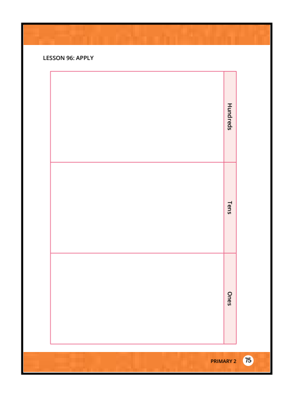
TEACHER SAY: How did we solve this in our last math lesson? Tell your Shoulder Partner.

 **STUDENTS DO:** Tell their **Shoulder Partner** how they solved this problem yesterday.

TEACHER SAY: We followed the pattern to find the difference. If we know that 150 - 100 = 50, then to solve 150 - 99, we just need to take one less away. 150 - 99 = 51. We used the cluster problems to help us solve. But how would we solve this problem if we did not have the cluster to help? What if I asked you to solve this problem: 82 - 57? Brainstorm with your Shoulder Partner.

TEACHER DO: Write 82 – 57 = ______ on the board.

 **STUDENTS DO:** **Brainstorm** with **Shoulder Partner** on how to solve the problem.



2. TEACHER SAY: **The answer is regrouping. Let's take a look at how we regroup a subtraction problem. Open your Mathematics Student Book to page Lesson 96: Apply. You are going to be working in groups. Take your book and pencil with you.**

 STUDENTS DO: Open their Mathematics Student Book to page Lesson 96: Apply.

TEACHER DO: Put students into groups of four.

 STUDENTS DO: Get into assigned groups.

TEACHER DO: Hand out place value materials (bundles and loose straws) to students.

TEACHER SAY: **There is a place value mat in your book. The first thing I want you to do with your group is to use the strategies we have been practicing the past few days to create the number 82 using the place value straws and mat. Once your group has created the number 82, raise your hand.**

 STUDENTS DO: Work with group to create the number 82 using the straws. Raise their hand when they are done.

TEACHER DO: Call on a group to share their answer.

TEACHER SAY: **Great. We can show the number 82 as 8 Tens and 2 Ones.**

Note to the Teacher: You are modeling the problem using straws so you can physically unbundle them to regroup. The drawings below are to help you model; you will not draw them in this lesson.

TEACHER DO: Model the problem using bundles of 10 and Ones. Place the straws in the place value mat.

Hundreds	Tens	Ones

TEACHER SAY: **Now we need to write the second number in our math problem on our chart. 82 – 57. Keep your model for 82 at the top of your place value mat. That was the first number given, so it goes on top. Notice it is also bigger. When we subtract, the larger number always goes on top. On the bottom, I will write 57. I will write the 5 in the Tens column and the 7 in the Ones column.**

TEACHER DO: Model writing the problem in the correct place on the mat.

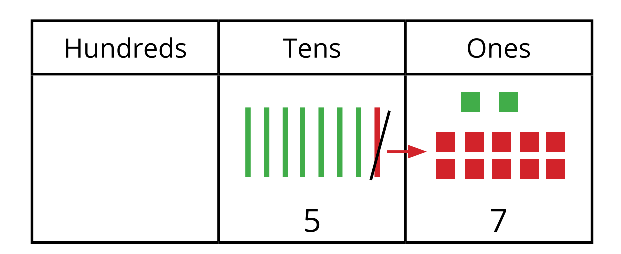
Hundreds	Tens	Ones
	5	7

TEACHER SAY: **Now it is time for us to subtract. We start with the Ones. What is 2 – 7? Raise your hand to answer.**

 STUDENTS DO: Raise hand to answer. Selected students share their thinking.

TEACHER SAY: **Yes, we cannot take 7 away from 2. We need to regroup. Remember when we regrouped with addition, we would take 10 Ones and make a new Ten. Well, when we regroup with subtraction, we take one of our Ten bundles and break it apart into 10 Ones. Watch me first.**

TEACHER DO: Take one of the Ten bundles and unbundle it to show 10 Ones.



TEACHER SAY: I just took one of the 8 Tens and decomposed it into 10 Ones. Now when you look at the Ones column, we have 12 – 7. What is 12 – 7? Show me on your fingers.

 **STUDENTS DO:** Hold up 5 fingers.

TEACHER DO: Write 5 on the board in the Ones place: 82 – 57= ___ 5

TEACHER SAY: Right. Now, let's subtract the Tens. We have 7 Tens – 5 Tens. What is 7 – 5? Show me on your fingers.

 **STUDENTS DO:** Hold up 2 fingers.

TEACHER DO: Write 2 on the board in the Tens place: 82 – 57 = 25.

TEACHER SAY: Let's read our subtraction problem together.

 **STUDENTS DO:** Read aloud with the teacher: 82 – 57 = 25.

3. TEACHER SAY: We just regrouped a subtraction problem. Do you think you can solve one on your own with your group? Let's try 44 – 19 =_____.

TEACHER DO: Write 44 – 19 =_____ on the board.

TEACHER SAY: Work as a group. Build the first number using your place value materials. Decide if you need to regroup. If so, regroup and then subtract to find the difference. When you are finished, raise your hand so I know you are finished.

 **STUDENTS DO:** Work with their group to solve the regrouping problem using place value materials.

TEACHER DO: Walk around the room to help as needed. Acknowledge groups as they finish and raise their hands. As groups finish, walk around and check their work.

Note to the Teacher: As an extension activity, have groups that finish early solve another subtraction problem to solve that requires regrouping, such as 61 – 27 or 84 – 35.

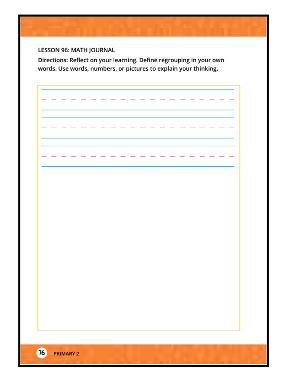
TEACHER SAY: Great group work today. I appreciate how hard you are working to learn how to subtract with regrouping. You may go back to your desk now. Please put your Tens bundles back together. When you are done, bring me your place value materials. You need your student book for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on the process of subtracting with regrouping and record their thoughts in their Mathematics Student Book.



1. TEACHER SAY: **Turn to page Lesson 96: Math Journal in your student book.**

 STUDENTS DO: Turn to page Lesson 96: Math Journal in the book.

TEACHER SAY: **Today we used bundles of straws and loose straws to help us solve subtraction problems with regrouping. As we reflect today, I would like you to define regrouping in your own words. Write your definition. You may use words, numbers, or pictures.**

 STUDENTS DO: Write a definition of regrouping in the student book.

TEACHER DO: If time allows, select a few students to share definitions with the class.

 STUDENTS DO: Selected students share definitions with the class.

TEACHER SAY: **Wonderful ideas. You may put away your student books for today. Give yourselves a pat on the back.**

 STUDENTS DO: Put away student books. Give themselves a pat on the back.

Lesson 97 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2-digit numbers with regrouping. • Apply strategies to estimate differences.	• Difference • Minuend • Subtraction • Subtrahend	• Calendar Math area • Large Hundreds–Tens–Ones place value mat • Place value materials from Lesson 84 • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at four new shapes today.

TEACHER DO: Draw or post four different two-dimensional shapes on the board. Use a variety of shapes each day, including triangles, quadrilaterals, pentagons, and hexagons..

- Using **Calling Sticks**, choose students to do one or more of the following:
- Identify the four shapes.
- List the numbers of sides and vertices of each shape.
- Compare the shapes. Are there similar shapes—two different quadrilaterals or two different triangles?
- Sort the shapes by characteristics.
- Draw a different shape that has similar characteristics. For example, if a rectangle is drawn, have students draw a different quadrilateral with four sides and four vertices.
- Discuss if a shape can be cut into two smaller shapes. (A rectangle or square can be made into two triangles; a regular hexagon can be cut into two trapeziums or six triangles.)



STUDENTS DO: Selected students answer questions about shapes.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students build on their knowledge of regrouping in subtracting by adding drawings to their regrouping models. This will be an important transition for the students as they move from using a concrete model (straws) to a more abstract model by drawing. Encourage students to use what they learned about regrouping in addition to help them regroup in subtraction.

This lesson incorporates the computational thinking practice of developing and using abstractions. Students have prepared for this lesson over time by familiarizing themselves with concrete manipulatives and turning them into abstract drawings. They have also practiced regrouping during Calendar Math, though they may not have known that is what they were doing. Now, students are asked to translate their understanding of these models into an abstract algorithm for subtracting with regrouping. The algorithm increases efficiency and prepares them for more complex algorithms in later years (without losing the "why" of regrouping).

1. TEACHER DO: Write the following problem on the board: 16 – 8 =_____.

TEACHER SAY: **How would you solve this problem? Think for a minute and then raise your hand to answer.**

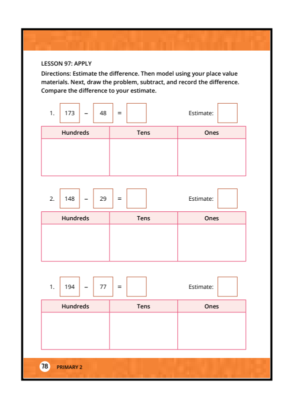


STUDENTS DO: Use **Think Time** solve the problem. Raise their hand to answer. Selected students share their answers.

TEACHER SAY: **Good thinking. There are several ways we can solve this. Some may have started with 16 and counted back 8. Some may have started with 8 and counted on to 16. Some may have used their knowledge of doubles facts to solve this problem. These are all great ways to solve, but no matter which strategy you use, the difference is always 8. 16 – 8 = 8.**

TEACHER DO: Add the answer to the equation on the board: 16 – 8 = 8.

TEACHER SAY: **Because 16 – 8 uses small numbers, it is easier to solve mentally. But when we are asked to subtract larger numbers, we may not be able to solve the problem mentally. We may need to regroup like we did yesterday. Today we are going to practice regrouping with our place value materials and place value mats. We are also going to draw the problems. Open your Mathematics Student Book to page Lesson 97: Apply.**



LESSON 97: APPLY

Directions: Estimate the difference. Then model using your place value materials. Next, draw the problem, subtract, and record the difference. Compare the difference to your estimate.

1. 173 – 48 = ☐ Estimate: ☐

Hundreds	Tens	Ones

2. 148 – 29 = ☐ Estimate: ☐

Hundreds	Tens	Ones

1. 194 – 77 = ☐ Estimate: ☐

Hundreds	Tens	Ones

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STUDENTS DO: Open Mathematics Student Book to page Lesson 97: Apply.

2. TEACHER SAY: **There are problems in your book and a place value mat. You are going to work in groups. Once you know your group, move to sit together. Take your book and pencil with you.**

TEACHER DO: Put students into groups of four.



STUDENTS DO: Move into assigned groups, taking student books and pencils.

TEACHER DO: Hand out place value materials to each group. Write the following problem on the board: 173 – 48 = _____.

TEACHER SAY: **It would be very difficult to solve this problem by counting back or counting on. So let's use what we know about regrouping to solve. Before we solve, let's estimate the answer. Write your estimate in your book. You can use the front-end estimation strategy or the rounding strategy.**



STUDENTS DO: Record an estimate for 173 – 48 = _____.

TEACHER SAY: **Great. Once we solve, we will compare the difference to our estimates. Now what do we need to do first to solve? Pop up to answer.**



STUDENTS DO: Pop up to answer.

TEACHER SAY: **That is correct. We need to build the largest number. This number is called the MINUEND. Whisper into your hand which number is the minuend.**

 **STUDENTS DO:** Whisper: 173.

TEACHER SAY: **Yes, 173 is the largest number. It will be the minuend in this problem. Use your bundles and loose straws to build this number on the place value mat in your student book. I see a 100 in the number 173. On your fingers, show me how many bundles of 10 you need to make 100.**

 **STUDENTS DO:** Show 10 on their fingers.

TEACHER SAY: **Yes. To make 100, group 10 bundles of 10 together. You may rubber band them together if you would like.**

 **STUDENTS DO:** Build the number 173 on the place value mats.

TEACHER SAY: **Now that you have built the minuend, let's draw it. Drawings are another way to help us see numbers. You draw in your books and I will draw on the board. Remember, we will draw 173 at the top of our chart because it was the first number given to us in the problem, and it is the largest number. When you subtract, the bigger number, or minuend, always goes on top.**

TEACHER DO: Draw the following on the board.

Hundreds	Tens	Ones

TEACHER SAY: **Great work. What is our next step? Pop up to answer.**

 **STUDENTS DO:** Pop up to answer.

TEACHER SAY: **Yes. We need to write the second number in our problem: 48. This is the number we will be subtracting from 173. We call this number the subtrahend. The subtrahend is always the smaller number in the problem. Write 48 in your place value chart.**

 **STUDENTS DO:** Write the number 48 on the place value chart in their book.

TEACHER DO: Fill in the chart as done below:

Hundreds	Tens	Ones
–	4	8

TEACHER SAY: **Wonderful, now we can subtract. When we subtract, where do we start?**

 **STUDENTS DO:** Say: the Ones place.

TEACHER SAY: **Yes. In the Ones place we have 3 - 8. We cannot take away 8 if there are only 3, so we must regroup. Remember, to regroup we take one of our Tens bundles and unbundle it into 10 Ones. Do that now.**

 **STUDENTS DO:** Unbundle one Tens bundle and make 10 Ones.

TEACHER SAY: **Let me show you how to draw this. First, you will cross out one of your Tens. This is to be sure you do not count that as a Ten anymore. You do it in your own book.**

TEACHER DO: Cross out one of the Tens.

Hundreds	Tens	Ones
–	4	8

STUDENTS DO: Cross out one of the Tens.

TEACHER SAY: **When we unbundle that Ten, it becomes 10 Ones. Ones belong in the Ones place, so I am going to draw the new Ones in the Ones place. You do it too.**

Hundreds	Tens	Ones
–	4	8

TEACHER SAY: **Great work. Now 173 has 1 Hundred, 6 Tens, and 13 Ones. It is still worth 173, though. Now it is time to subtract. Subtract and write the difference in your book. When you are finished, raise your hand.**



STUDENTS DO: Solve by subtracting. Record the difference in their book. Raise hand when done.

TEACHER DO: Select a student with their hand raised to show their work at the board.



STUDENTS DO: Selected student shares their work at the board and writes the difference to complete the equation: 173 – 48 = 125.

TEACHER SAY: **Great job, class. That was a lot of hard work but we found the difference. Let's compare the difference to our estimate. Were you close? Share your findings with your Shoulder Partner.**



STUDENTS DO: Compare the difference to their estimate and share with their **Shoulder Partner**.

3. TEACHER SAY: **Now it is time to practice with your group. Remember to estimate the difference first, model the problem using your place value materials, draw it on the place value chart in your book, find the difference, and then compare the difference to your estimate. You may begin.**



STUDENTS DO: Work with group to solve the problems by estimating, modeling, drawing, subtracting, and comparing the difference to their estimate.

TEACHER DO: Walk around the room to monitor and help students as needed. At the end of Learn time, use an **Attention Getting Signal**.

TEACHER SAY: **Great work, everyone. Please bring me your place value materials and return to your seat. You will need your student book for Reflect.**



STUDENTS DO: Give place value materials to the teacher. Return to their seat.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students consider their preferred method for subtracting with regrouping and share their thinking with the class.

1. TEACHER SAY: **Today we used two different models to help us solve subtraction problems with regrouping—place value straws and drawings. Think quietly for a moment about each method. Review your work if needed. Which model do you prefer to use? Why? In a minute, you will discuss your thoughts with your Shoulder Partner.**

 **STUDENTS DO:** Think about which regrouping method they prefer and why.

TEACHER DO: After one minute, have students share their thinking with a **Shoulder Partner**.

 **STUDENTS DO:** Share thoughts with a **Shoulder Partner**.

TEACHER DO: If time allows, ask a few students to share their thinking with the class. Take note of misconceptions so you can correct them.

 **STUDENTS DO:** Selected students share their thinking with the class.

TEACHER SAY: **Wonderful job today, class. You may put your student books away.**

 **STUDENTS DO:** Put away books.

Lesson 98 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Use place value models to regroup and subtract. • Subtract 2- and 3-digit numbers with regrouping. • Apply strategies to estimate differences.	• Difference • Minuend • Subtraction • Subtrahend	• Calendar Math area • Large Hundreds–Tens–Ones place value mat • Optional: Place value materials from Lesson 84 • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at four new shapes today.

TEACHER DO: Draw or post four different two-dimensional shapes on the board. Use a variety of shapes each day, including triangles, quadrilaterals, pentagons, and hexagons.

- Using **Calling Sticks**, choose students to do one or more of the following:
- Identify the four shapes.
- List the numbers of sides and vertices of each shape.
- Compare the shapes. Are there similar shapes—two different quadrilaterals or two different triangles?
- Sort the shapes by characteristics.
- Draw a different shape that has similar characteristics. For example, if a rectangle is drawn, have students draw a different quadrilateral with four sides and four vertices.
- Discuss if a shape can be cut into two smaller shapes. (A rectangle or square can be made into two triangles; a regular hexagon can be cut into two trapeziums or six triangles.)



STUDENTS DO: Selected students answer questions about shapes.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students practice subtracting with regrouping by drawing place value models for the minuend and subtracting the subtrahend. For differentiation, students who need additional practice with concrete models may use the place value manipulatives used in the previous lesson.

1. TEACHER SAY: **In our last math lesson, we used straws as place value models and drew place value pictures to help us subtract and regroup. Turn and Talk to your Shoulder Partner. Explain the steps to regroup and subtract by drawing.**


STUDENTS DO: Turn and Talk to their Shoulder Partner to explain how to regroup a subtraction problem by drawing it.

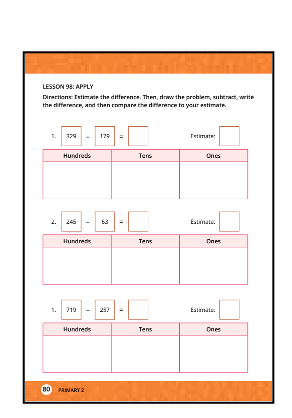
TEACHER DO: Select a few students to share their explanations. Students should mention drawing the largest number, or minuend, as a set of Tens and Ones, decomposing one Ten into ten Ones and drawing the new Ones, and subtracting to find the difference.


STUDENTS DO: Selected students share their explanations with the class.

TEACHER SAY: **So far, we have solved subtraction problems where we had to regroup a Ten to make Ones. Today we are going to solve subtraction problems where we have to regroup to make Tens. If there are not enough Tens for us to subtract, where do you think we can get one? How do you know? Raise your hand to answer.**


STUDENTS DO: Raise hand to volunteer. Selected students share thinking and explanations.

TEACHER SAY: **Wow, great. Yes, remember, 100 is 10 sets of 10. If we do not have enough Tens to subtract, we can take one of the Hundreds and regroup it into 10 Tens.**


LESSON 98: APPLY

Directions: Estimate the difference. Then, draw the problem, subtract, write the difference, and then compare the difference to your estimate.

1. 329 – 179 = ☐ Estimate: ☐

Hundreds	Tens	Ones

2. 245 – 63 = ☐ Estimate: ☐

Hundreds	Tens	Ones

1. 719 – 257 = ☐ Estimate: ☐

Hundreds	Tens	Ones

80 PRIMARY 2

2. TEACHER SAY: **Let's solve one together. Take out your Mathematics Student Book and turn to page Lesson 98: Apply.**


STUDENTS DO: Take out student books and turn to page Lesson 98: Apply.

TEACHER DO: Write the following problem on the board: 329 – 179 = ______.

TEACHER SAY: **This problem is in your student book. We will solve this one together. First, estimate the difference. You can use the rounding strategy or the front-end estimation strategy. Write your estimate in your student book.**


STUDENTS DO: Apply a strategy to estimate and record an estimate in the student book.

TEACHER SAY: **Now let's draw the problem. Remember, the minuend, or the larger number, goes on top and the subtrahend, or smaller number, goes on the bottom.**

TEACHER DO: Use Calling Sticks to select students to help you draw on the board as the other students draw in the student book.


STUDENTS DO: Selected students help draw the problem on the board.

TEACHER DO: The completed problem should look like this :

Hundreds	Tens	Ones
– 1	7	9

TEACHER SAY: Now that the drawing is complete, we may solve the problem. Starting in the Ones place, do we need to regroup in the Ones? Why or why not? Raise your hand.

 STUDENTS DO: Raise hand to volunteer. Selected students answer the question.

TEACHER DO: If necessary, correct any misconceptions.

TEACHER SAY: That is right. We do not need to regroup the Ones place because we can subtract 9 Ones from 9 Ones. What is the difference?

 STUDENTS DO: Call out: zero.

TEACHER SAY: Where should we write the 0?

 STUDENTS DO: Call out: Ones place.

TEACHER DO: Write a 0 in the Ones place: 329 – 179 = _ _ 0.

STUDENTS DO: Write a 0 in the Ones place in their book.

TEACHER SAY: Now let's move to the Tens place. Do we need to regroup to subtract the Tens? Stand up if you think we need to regroup. Squat down if you think we do not.

 STUDENTS DO: Stand or squat.

TEACHER SAY: If you are standing, you are correct. We cannot subtract 7 Tens from 2 Tens, so we need to regroup. Where will we regroup to get new Tens? Give me a Thumbs Up if you know.

 STUDENTS DO: Give a **Thumbs Up** to volunteer. Selected students answer the question.

TEACHER SAY: Yes, we get 10 new Tens by regrouping a Hundred. So just as we crossed out a Ten in our last lesson and made 10 Ones, we will cross out a Hundred and make 10 Tens. We now have 2 Hundreds, 12 Tens, and 9 Ones. It still equals 329. Let's break up 1 Hundred now.

TEACHER DO: Cross out 1 Hundred and regroup it into 10 Tens.

Hundreds	Tens	Ones
– 1	7	9

TEACHER SAY: Now can we solve 12 – 7. Show me the answer on your fingers.

 STUDENTS DO: Show 5 on their fingers.

TEACHER SAY: Where do we write the 5? Pop up to answer.

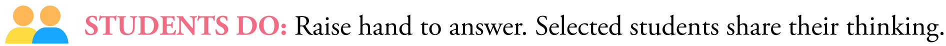
 STUDENTS DO: Pop up to answer.

TEACHER SAY: Yes, the Tens place. I will write it on the board. You write it in your book.

TEACHER DO: Write a 5 in the Tens place: 329 – 179 = _ 50

 STUDENTS DO: Write a 5 in the Tens place in their book.

TEACHER SAY: Finally, let's subtract the Hundreds. Why do we not count the Hundred we crossed out?



STUDENTS DO: Raise hand to answer. Selected students share their thinking.

TEACHER SAY: **That is right. That Hundred is no longer there because we turned it into 10 Tens. So we have 2 Hundreds - 1 Hundred. 2 - 1 = 1. Where do we write the 1?**



STUDENTS DO: Raise hand to answer. Selected students answer the question.

TEACHER DO: Complete the problem: 329 – 179 = 150.



STUDENTS DO: Complete the problem in their book.

TEACHER SAY: **So 329 – 179 = 150. Compare the difference to your estimate. If you were close, wave at me.**



STUDENTS DO: Wave if their estimate was close to the difference.

3. TEACHER SAY: **Wonderful. Now you are going to complete three more subtraction problems on your own. You will have to regroup in either the Ones place or the Tens place, so pay attention to the numbers. For each problem you will estimate the difference, draw the problem, solve the problem, and then compare the difference to your estimate. If you need place value straws, you may come and get them. Otherwise, you should draw your problems. You may begin.**



STUDENTS DO: Draw or use concrete place value models to complete the subtraction problems in the student book.

TEACHER DO: Circulate around the room and help students who are struggling. Take note of students who need additional support and students who may be able to help others.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students compare their work with a **Shoulder Partner's**. *Students compare their estimates, drawings, and answers. The goal is to promote student conversations about processes, strategies, and errors to improve understanding.*

1. TEACHER SAY: **To reflect on your learning, I want you to compare your work with your Shoulder Partner's. Compare your estimates, drawings, and answers. Are they the same? If not, which one is correct and why? Did you use the same strategies?**



STUDENTS DO: Compare their work with a **Shoulder Partner's**. Identify and correct errors.

TEACHER SAY: **Great work. Give your partner a high five and put away your student book.**



STUDENTS DO: Give their partner a high five and put away their student book.

Lesson 99 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Subtract 2- and 3-digit numbers with regrouping. • Make connections between concrete and abstract models of regrouping. • Apply strategies to estimate differences.	• Review vocabulary as needed.	• Calendar Math area • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER
No new preparation needed.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's look at four new shapes today.

TEACHER DO: Draw or post four different two-dimensional shapes on the board. Use a variety of shapes each day, including triangles, quadrilaterals, pentagons, and hexagons.

- Using **Calling Sticks**, choose students to do one or more of the following:
- Identify the four shapes.
- List the numbers of sides and vertices of each shape.
- Compare the shapes. Are there similar shapes—two different quadrilaterals or two different triangles?
- Sort the shapes by characteristics.
- Draw a different shape that has similar characteristics. For example, if a rectangle is drawn, have students draw a different quadrilateral with four sides and four vertices.
- Discuss if a shape can be cut into two smaller shapes. (A rectangle or square can be made into two triangles; a regular hexagon can be cut into two trapeziums or six triangles.)



STUDENTS DO: Selected students answer questions about shapes.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students are introduced to an algorithm for subtracting with regrouping. The problems require regrouping in one place. This lesson helps students begin to make connections between the physical act of regrouping and the abstract subtraction algorithm.

1. TEACHER SAY: **We have been working on subtracting with regrouping for several days and you are getting very good at it. However, we realized several days ago that it takes a lot of time to use straws or draw pictures to regroup and solve problems. We need to get more efficient. EFFICIENT means that we work quicker, but still get the correct answer.**

TEACHER DO: Write the following on the board: 456 – 39 = _____. Then write the problem in the large Hundreds–Tens–Ones chart.

Hundreds	Tens	Ones
4	5	6
–	3	9

TEACHER SAY: **Today I am going to show you how to solve subtraction problems with regrouping using a problem-solving operation. Where do we begin subtracting?**

 STUDENTS DO: Call out: Ones place.

TEACHER SAY: **Yes, we begin subtracting in the Ones place. I see 6 - 9. If we have 6 pencils, can we take 9 pencils away? Raise your hand if you want to share your thinking.**

 STUDENTS DO: Raise hand to volunteer. Selected students share their thinking.

TEACHER SAY: **Correct, we cannot subtract 9 from 6, so we must regroup. We do not have enough Ones, so where will we get them?**

 STUDENTS DO: Call out: the Tens place.

TEACHER SAY: **Yes, the Tens place. Good. We have 5 Tens. If we were using straws, we would take one of the bundles of 10 apart to make 10 Ones. If we were drawing a pictures, we would cross out one of the Tens and draw 10 small Ones squares. I am going to do the same thing here, but without straws or drawings. First, I am going to take one of the Tens away. There are 5 Tens. If I take one away, I will have 4.**

TEACHER DO: Cross out 5 and write 4.

Hundreds	Tens	Ones
4	4 ~~5~~	6
–	3	9

TEACHER SAY: **Now I need to take that Ten over to the Ones place. What is 6 Ones + 10 Ones?**

 STUDENTS DO: Call out: 16.

TEACHER SAY: **Good, so I am going to write 1 so we can see there are 16 Ones now.**

TEACHER DO: Add a 1 to the 6 in the Ones place.

Hundreds	Tens	Ones
	4	
4	~~5~~ →	16
–	3	9

TEACHER SAY: What is 16 - 9? Show me on your fingers.

TEACHER DO: Give students a moment to calculate the answer.

STUDENTS DO: Hold up 7 fingers.

TEACHER DO: Write 7 in the Ones place in the answer row.

Hundreds	Tens	Ones
	4	
4	~~5~~ →	16
–	3	9
		7

TEACHER SAY: Well done. Now we go to the Tens place. I see 4 Tens – 3 Tens. Can we subtract 3 from 4?



STUDENTS DO: Call out: yes.

TEACHER SAY: Yes, so we do not need to regroup. What is 4 - 3? Show me on your fingers.



STUDENTS DO: Hold up 1 finger.

TEACHER DO: Write 1 in the Tens place in the answer row.

Hundreds	Tens	Ones
	4	
4	~~5~~ →	16
–	3	9
	1	7

TEACHER SAY: Great job. Now, let's look at the Hundreds place. What is 4 Hundreds - zero Hundreds? Show me on your fingers.



STUDENTS DO: Hold up 4 fingers.

TEACHER DO: Write 4 in the Hundreds place in the answer row.

Hundreds	Tens	Ones
	4	
4	~~5~~ →	16
–	3	9
4	1	7

2. TEACHER SAY: **Look at the problem. I did on the board exactly what we did with straws and drawings, but I showed the work using numbers. Now we are going to try some together. Take out your Mathematics Student Book and open it to page Lesson 99: Apply.**


STUDENTS DO: Open their Mathematics Student Book to page Lesson 99: Apply.

TEACHER SAY: **There are several Hundreds–Tens–Ones charts in your book. I am going to give you subtraction problems. You will write them in the place value charts. Then we will work together to solve them. Raise your hand if you have questions.**


STUDENTS DO: Raise their hand to ask questions, if necessary.

TEACHER DO: Clarify directions as needed. Write the following problem on the board and in the Hundreds–Tens–Ones chart: 265 – 73 = _____.

TEACHER SAY: **Write this problem in your Hundreds–Tens–Ones chart in your book.**


STUDENTS DO: Write the subtraction problem in the place value chart in their book.

TEACHER DO: Work through each step of the problem with students, asking them to provide information and answers (and show their work) whenever possible. Relate the process of regrouping to the physical models students used. Encourage students to ask questions and help each other build understanding of the operation. Repeat the process for several problems that involve regrouping in one place. Examples are below.
562 – 145
638 – 46
43 – 17
347 – 82


STUDENTS DO: Work with the teacher to solve each problem. Provide answers and respond to questions when selected. Ask questions and help each other as needed. Record their work in the student book.

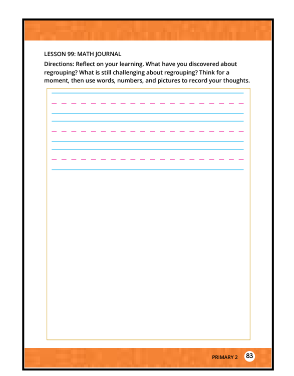
TEACHER DO: At the end of the Learn segment, have students leave their Mathematics Student Books open to today's lesson for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: Students reflect on their work adding and subtracting with regrouping and write about what they have learned. This exercise gives them an opportunity to make connections between their learning in this chapter and the last one.



1. TEACHER SAY: **Turn to page Lesson 99: Math Journal in your book.**

 STUDENTS DO: Turn to page Lesson 99: Math Journal in their book.

TEACHER SAY: **Reflect on what you have learned about adding and subtracting with regrouping. Think about how we moved from composing and decomposing with straws to making drawings to using numbers. What have you discovered? What is still challenging? Think for a moment, then record your thoughts on your Math Journal page. You can use words, numbers, and pictures.**

 STUDENTS DO: Respond to the prompt in the student book. Record their thinking using words, numbers, and pictures.

TEACHER DO: As students write, walk around and read some of their entries. Be sure to read all of the entries at a later time. They will provide valuable information about students' learning related to regrouping.

TEACHER SAY: **Wonderful work today. Please give yourself a pat on the back and put away your student book.**

 STUDENTS DO: Pat themselves on the back and put away their book.

Lesson 100 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Share 100th day collections. • Analyze their math learning over the last 100 days.	• Review vocabulary as needed.	• Calendar Math area • 100th Day Celebration materials • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather materials (students' projects, snacks, and so on) as needed for the 100th Day celebration.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today is the 100th day of school. In Calendar Math, students make a new Ten and then discover they need to regroup the Tens to make a Hundred. Be sure to link this process to the regrouping they have been doing to solve addition and subtraction problems.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Today is the 100th day so be sure to emphasize this part of Calendar and the days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket. Today, they will have to regroup twice—first to create a new Ten out of 10 Ones and then to create a new Hundred out of 10 Tens.

2. TEACHER SAY: Let's look at four new shapes today.

TEACHER DO: Draw or post four different two-dimensional shapes on the board. Use a variety of shapes each day, including triangles, quadrilaterals, pentagons, and hexagons.

- Using **Calling Sticks**, choose students to do one or more of the following:
- Identify the four shapes.
- List the numbers of sides and vertices of each shape.
- Compare the shapes. Are there similar shapes—two different quadrilaterals or two different triangles?
- Sort the shapes by characteristics.
- Draw a different shape that has similar characteristics. For example, if a rectangle is drawn, have students draw a different quadrilateral with four sides and four vertices.

- Discuss if a shape can be cut into two smaller shapes. (A rectangle or square can be made into two triangles; a regular hexagon can be cut into two trapeziums or six triangles.)

 **STUDENTS DO:** Selected students answer questions about shapes.



Learn (40 minutes)

Directions

Note to the Teacher: On this 100th day of school, students share the 100th day collections they have been working on since Lesson 91.

1. TEACHER SAY: Today is a very special day. It is our 100th day of school. I am very excited to see all of your 100th day collections. Please take out your collection and display it on your table. We will do a Gallery Walk to see everyone's collections. See how quickly you can count some of them.

 **STUDENTS DO:** Participate in a **Gallery Walk** to view their friends' 100th day collections. Count some of the items.

TEACHER DO: Give students time to walk around and look at the 100th day collections. Walk around and ask students about their work. If families are attending, encourage them to participate in the **Gallery Walk**. If snacks are being served, provide time for students to eat after the **Gallery Walk**. If snacks are not being served, pull **Calling Sticks** to select students to present their collections to



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students think about how much they have learned about mathematics over the last 100 days and share their thoughts with the class. This exercise will help all students realize that they have learned a great deal, even if they still have difficulty in some areas of math.

1. TEACHER SAY: I loved seeing your 100th day collections. You were so creative, and today was wonderful. Let's think about everything we have learned in math over the last 100 days. Take out your Mathematics Student Book.

 **STUDENTS DO:** Take out their Mathematics Student Book.

TEACHER SAY: Usually, I have you turn to a specific page. But today I want you to look through your student book and reflect on all of the math skills and concepts you have learned since the first day of school.

 **STUDENTS DO:** Look through their student book to review what they have learned in math over the last 100 days.

TEACHER DO: After a few minutes, ask students to raise their hands to volunteer to share their thinking. If necessary, ask questions to prompt their responses, such as the following:

- What did you learn that was really challenging at first, but you practiced and learned it?
- What are you still working on in math?
- What was the most fun lesson you remember?
- Do you learn more when you work on your own, with a partner, or with a small group? Why do you think so?
- How are some of the skills you are learning connected to each other?

STUDENTS DO: Share their thoughts and ideas about their learning. Respond to the teacher's questions, if asked.

TEACHER SAY: **We have all come such a long way in 100 days. Congratulations to all of you, and thank you for sharing your thinking. Put away your student book and give yourself a hug.**

 **STUDENTS DO:** Put away their book and hug themselves.

PRIMARY 2

Mathematics

COMMUNICATION

Chapter 5

Lessons 101 to 110

Lessons 101 to 110

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 101 to 110, students will work toward the following learning indicators:

B. OPERATIONS AND ALGEBRAIC THINKING:

1.b. Fluently add and subtract within 20 using mental strategies.

1.e. Recall all sums of two 1-digit numbers.

E. GEOMETRY:

1.d. Partition circles and rectangles into two, three, or four equal parts.

1.e. Explain that each part is part of a whole or a set of objects.

1.f. Describe equal parts of a whole or set using words such as halves, thirds, half of, a third of, and so on, and describe the whole as two halves, three thirds, four fourths.

CH 5 Pacing Guide

LESSON	INSTRUCTIONAL FOCUS
101	Students will: • Participate in Calendar Math activities. • Create halves, thirds, and fourths of circles. • Identify equal and unequal parts of a whole.
102	Students will: • Participate in Calendar Math activities. • Use appropriate vocabulary to describe fractions. • Investigate the attributes of halves, fourths, and thirds.
103	Students will: • Participate in Calendar Math activities. • Investigate fractions with a numerator greater than 1. • Make connections between images of fractions and fraction names.
104	Students will: • Participate in Calendar Math activities. • Identify multiple ways to divide a rectangle into fractional parts. • Make connections between images of fractions and fraction names.
105	Students will: • Participate in Calendar Math activities. • Create fractions using word or number clues.
106	Students will: • Participate in Calendar Math activities. • Identify numbers as even or odd. • Name all fractional parts for halves, thirds, and fourths.
107	Students will: • Participate in Calendar Math activities. • Identify and write fractional parts of a set. • Compare fractions of a whole and of a set.
108	Students will: • Participate in Calendar Math activities. • Identify fractions of a set of objects. • Write fraction questions about a set of objects.
109	Students will: • Participate in Calendar Math activities. • Solve story problems involving fractions of a whole or a set. • Evaluate their progress in learning about fractions.

LESSON	INSTRUCTIONAL FOCUS
110	Students will: • Participate in Calendar Math activities. • Partition rectangles into three or four equal parts. • Demonstrate understanding that each fractional part of a rectangle is part of a whole. • Describe equal parts of a whole using fraction vocabulary.

Chapter Preparation for Teacher

For Lesson 101:

- Cut out four large circles (25 to 30 cm across) to model halves, thirds, fourths, and a circle divided into unequal parts.
- Cut out three small circles (10 to 15 cm across) for each student. Students will use these to model halves, thirds, and fourths.
    - If you have a lot of students, consider having students work with partners.

For Lesson 102:

- Create a large chart as shown below.

Fraction in pictures and numbers	◯	◯	◯
Number of equal parts			
Fraction in words			
Vocabulary			

- The chart should have three columns with a circle drawn at the top of each.
- You will add the lines for equal parts and vocabulary to the chart during the lesson.

For Lesson 104:

- Collect blank copy paper. Each student will need one piece of paper.
- Create a large poster of a Fraction Wall as shown below.

For Lesson 105:

- Print and cut sets of Build-a-Fraction Cards (one set for each group of students). See the Build-a-Fraction Cards Blackline Master.

For Lesson 106:

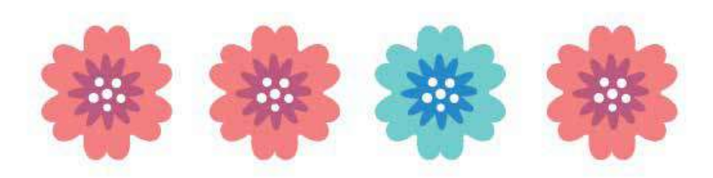
- Create a poster showing the following: a circle representing ⅓, a rectangle representing ¾, a

rectangle divided into four unequal parts with one part shaded, and a circle modeling $\frac{2}{2}$.

- Make sets of 30 counters (one set for each group).
- Gather one die for each small group of students.

For Lesson 107:

- Create a large version of the flower image on page Lesson 106: Math Journal of the Mathematics Student Book as shown below.



- Print sets of 2-sided counters (four counters per pair of students). Put counters in plastic cups. See the Two-Sided Counters Blackline Master.
- Create (or have available) sets of Number Cards 0–9 (one set per pair of students). See the Number Cards Blackline Master. (Students will use only numbers 2, 3, and 4.)

For Lesson 108:

- Place a set of objects in a brown (or other opaque) bag that represents $\frac{3}{4}$. For example, 3 red blocks and 1 blue block or 3 apples and 1 banana.

For Lesson 109:

- Print and cut out sets of Fraction Story Problem Cards (one set per small group of students).
    - Put sets in bags or rubber band together so that they can be easily stored and reused.

For Lesson 110:

- Make a sample, completed fraction flag divided into fourths to show students.
    - Make each fourth a different color.
    - Add a symbol or design to the center of your flag.
    - Complete a Fraction Flag Label for your flag.
- Have available an Egyptian flag to show as an example of a flag divided into thirds.
- Print out Fraction Flag Labels (one label per student). See the Fraction Flag Label Blackline Master.
- Gather materials for students to use to decorate their fraction flags. For example, markers, crayons, rulers, scissors, glue, glitter, sequins, pom poms, chenille stems, and so on.

Materials Used

Calendar math area

Large circles

Cutout circles

Student book

Pencils

Decorative materials

Crayons

Blank copy paper

Rulers

Dice

Counters

Numbered cards (1-9)

1	2	3
4	5	6
7	8	9
10		

White cardstock

Scissors

Glue or glue sticks

Fraction chart

Lesson 101 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Create halves, thirds, and fourths of circles.
- Identify equal and unequal parts of a whole.

KEY VOCABULARY

- Equal parts
- Fourths
- Fraction
- Half
- Halves
- Thirds
- Whole

MATERIALS

- Calendar Math area
- Four large circles for modeling fractions
- Cutout circles (three for each student)
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Cut out four large circles (25 to 30 cm across) to model halves, thirds, fourths, and a circle divided into unequal parts.

Cut out three small circles (10 to 15 cm across) for each student. Students will use these to model halves, thirds, and fourths.



Calendar Math (15 minutes)

Directions

Note to the Teacher: Today at the end of Calendar Math, students practice math facts. Primary 2 students need to recall addition and subtraction facts to 20, so a few minutes of review before the Learn section of the lesson will be helpful. A list of ideas for quick fact practice is included in this lesson. Choose a new activity each day or find one that your students really love and do that one for a few days. Remember, this additional component of Calendar Math should take only a few minutes. It is intended as a quick review of skills and concepts for students.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the last ten math lessons, we reviewed place value concepts and geometry. For the next ten lessons, we are going to take a few minutes each day to practice addition and subtraction facts to 20. Our goal is to get very quick with our answers.

TEACHER DO: Choose from one of the following activities to practice math facts with the class.

- **Popper**—Sixteen students stand a straight line. Determine where the middle of the line is. This is where the "popper" will go off. Place a maraca, clapper, or anything that makes noise there. Teacher and a student helper start on opposite ends of the line and show flash cards to individuals. As facts are correctly answered, students sit down and play goes on to the next person. When the last person (closest to the popper) answers correctly, he gets to sound the noisemaker, announcing a victory for his team. Play again with 16 new students.

- **Around the World**—One student is chosen to start and stands behind a seated student. The teacher shows a flashcard. The first student to say the correct answer wins and moves on. If it is the standing student, they move and stand behind the next seated student. If the standing student is incorrect, they take the seat of the seated student (who stands and moves on to the next spot). This can be played for a few minutes with the whole class or a small group of students.

- **Close to 10 or 20**—The teacher turns over three number cards and students try to create a number sentence with the three given numbers to get as close to 10 as they can. (Turn over five cards if the goal is 20.) The object of the game is have the lowest score.
  - Points are scored each hand by determining how far from the goal number the student is. For example, students may turn over 3, 5, and 8. They would then add 8 + 3 = 11 because that gives them the number closest to 10. Since they are 1 number away from 10, they would get 1 point. Students get 0 points for getting exactly 10.
  - Students may choose to use some or all of the cards. For example, 2, 3, 5 would give them 2 + 3 + 5 = 10.
  - Materials needed: number cards (0 to 9) or 3 to 5 dice. If enough cards are available, students can play in teams with their own cards.

 **STUDENTS DO:** Play the fact game selected by the teacher.



Learn (40 minutes)

Directions

Note to the Teacher: In this chapter, students explore fractions using circles and rectangles. They use a variety of vocabulary terms to explain various fractions, such as halves, thirds, fourths, quarters, and so on.

The first five lessons focus on fractions being equal parts of a whole and introduce the terms numerator, fraction bar, and denominator. The last five lessons focus on fractions as equal parts of a set. Students practice finding equal and unequal parts and build their own fractions. Today students are introduced to fractions with a focus on vocabulary connections and identifying equal and unequal parts.

1. TEACHER DO: Hand out three circles to each student.

TEACHER SAY: **Pick up one circle.**

 **STUDENTS DO:** Pick up one circle.

TEACHER SAY: **Today we are pretending these circles are pies. I want you to work with your Shoulder Partner and find a way to share the pie between the two of you. Fold it to show where you would cut it. When you are finished, raise your hand.**

 **STUDENTS DO:** Work with their **Shoulder Partner** to fold the circle into two pieces. Raise their hand when they are finished.

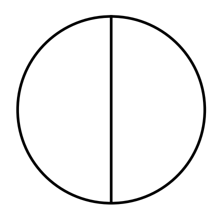
TEACHER DO: Draw three empty circles on the board. Select three students to draw how they folded their circle on the board.

 **STUDENTS DO:** Selected students draw their folds in the circles on the board.

Note to the Teacher: Make sure students understand that the line can be drawn in any direction through the middle of the circle.

TEACHER SAY: When you share with other people, whether it is food or toys, you have to be fair and share things equally. Each person's portion must be the same size. You just folded a circle to cut one pie into two pieces. Are the two parts of your circle equal?

TEACHER DO: If necessary, model folding the circle into two equal parts.



 **STUDENTS DO:** If necessary, refold the circle to make equal parts.

TEACHER SAY: You just made a circle with equal parts. Mathematicians call the equal parts fractions. Please say that with me.

 **STUDENTS DO:** Say: fractions.

TEACHER SAY: A FRACTION is a part of a whole. When we divide something into EQUAL PARTS, each part is a fraction of the whole thing. Let's look again at our circle.

 **STUDENTS DO:** Pick up the circle that is folded into two equal parts.

TEACHER SAY: How many equal parts does this circle have? Say the answer aloud.

 **STUDENTS DO:** Call out: two.

TEACHER SAY: I heard many of you recognize that this circle has two equal parts. We can say we divided this pie into HALVES. When we divide something into two equal parts, each part is HALF of the whole. Say half.

 **STUDENTS DO:** Say: half.

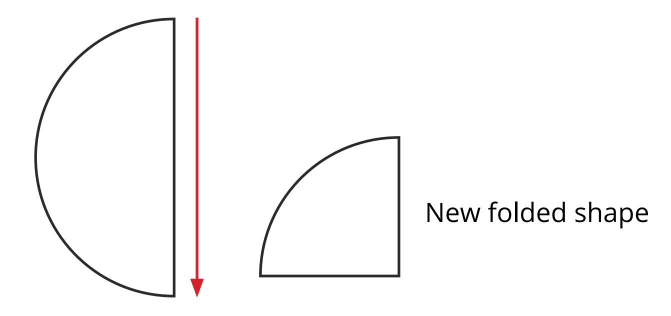
TEACHER SAY: Put that circle down and pick up another. Fold it in half like we did before.

TEACHER DO: Model folding the circle in half.

 **STUDENTS DO:** Fold the circle in half.

TEACHER SAY: Now our shape has two corners. Take one corner and fold it over to the other corner.

TEACHER DO: Model folding the circle into four equal parts.



 **STUDENTS DO:** Fold one corner over to the other corner.

TEACHER SAY: How many equal parts do you think we have in our circle now? Why do you think that? Turn and Talk to your Shoulder Partner.

 **STUDENTS DO: Turn and Talk** to their **Shoulder Partner** about how many equal parts are in their circle now.

TEACHER SAY: Open up your circles. Were you correct?

 **STUDENTS DO:** Open up their circles and count the equal parts.

TEACHER SAY: After we folded our circle in half two times, we now have four equal parts, or fourths. Each equal part of this circle is one FOURTH. Say fourth.

 **STUDENTS DO:** Say: fourth.

TEACHER SAY: Show me on your fingers how many equal parts we have in our circle divided into fourths.

 **STUDENTS DO:** Show 4 fingers.

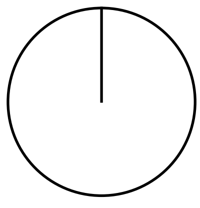
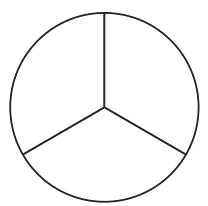
TEACHER SAY: Yes. When we have fourths, we have four equal, fractional parts. We can share our pie among four friends. However, one of our friends does not like pie. Pick up your final circle. Instead of folding, let's draw lines. Try to draw lines to make three equal parts. It is challenging, so it is okay if you are not able to do it perfectly.

 **STUDENTS DO:** Draw on their circle to make three equal parts.

Note to the Teacher: The students will struggle with this as it is very difficult to divide a circle into thirds. The goal is for students to experience the challenge and test their ideas about how to divide a circle into three equal pieces. Some students may draw two parallel lines to cut the circle vertically or horizontally but these lines do not create equal parts.

TEACHER SAY: Dividing a circle into three equal parts is very difficult. This is how mathematicians create three equal parts on a circle.

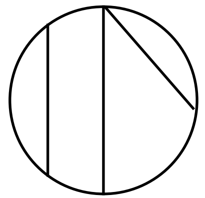
TEACHER DO: Show students how to draw lines on the circle to create thirds: Draw one line from the center of the circle to the edge. Then draw "legs" from the center to the edge to create a triangle shape.

TEACHER SAY: When a circle has three equal parts, we call the parts thirds. Each equal part is one THIRD. Turn your circle over and try to draw three equal parts. Remember, it is okay if you cannot do it perfectly, but try your best.

 **STUDENTS DO:** Try to divide their circle into thirds.

TEACHER DO: When students are finished, hold up your last large circle. Fold into four unequal parts. An example is shown below.



TEACHER SAY: I folded my circle into four parts. Are these parts fourths? Share your thinking with your Shoulder Partner. Give me a Thumbs Up when you are ready.

 **STUDENTS DO:** Share their thinking with their **Shoulder Partner**. Give a **Thumbs Up** when ready. Selected students share their thinking.

TEACHER DO: Confirm accurate thinking. Correct misconceptions. Be sure students understand that the circle does not show fourths because the parts are not equal. Put that circle down, but leave the other three circles up for students to see.

2. TEACHER SAY: **Wave at me if you can tell me what all of these fractions have in common.**

 STUDENTS DO: Wave to volunteer. Selected students share their thinking.

TEACHER DO: Confirm accurate observations. Correct misconceptions.

TEACHER SAY: **The most important thing to remember about fractions is that they are equal parts of a whole. Turn to page Lesson 101: Apply in your Mathematics Student Book.**

 STUDENTS DO: Turn to page Lesson 101: Apply in Mathematics Student Book.

TEACHER SAY: **On this page, you see six different circles divided into parts and the words "Equal Parts" and "Unequal Parts." I want you to use what you know about fractions to complete this activity. If the circle has equal parts, you will circle the words "Equal Parts." If the circle has unequal parts, you will circle the words "Unequal Parts." You may begin.**

 STUDENTS DO: Complete the activity in the student book.

TEACHER DO: When students are finished (and if time allows), have students compare work with their **Shoulder Partner**.

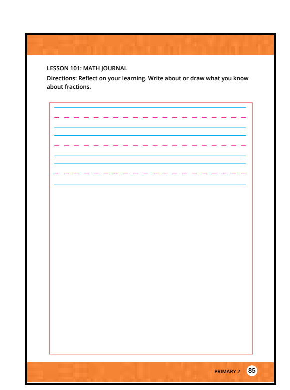
Note to the Teacher: As an extension activity, have students who finish early draw in their student book two shapes that have equal parts and two shapes that do not have equal parts.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students folded and drew on circles to create halves, thirds, and fourths and identified equal and unequal parts. For Reflect, students write or draw what they know about fractions.


LESSON 101: MATH JOURNAL

Directions: Reflect on your learning. Write about or draw what you know about fractions.

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1. TEACHER SAY: **Turn to page Lesson 101: Math Journal in your student book.**

 STUDENTS DO: Turn to page Lesson 101: Math Journal in their student book.

TEACHER SAY: **Today we learned a lot of fraction vocabulary words: halves, thirds, and fourths. We also learned that the most important thing about fractions is that all the parts have to be the same size. I want you to write about or draw what you know about fractions on your Math Journal page.**

 STUDENTS DO: Write or draw a response to the journal prompt in the student book.

TEACHER DO: As students work, walk around and read some of their entries. Be sure to read all entries at a later time. The Math Journal provides valuable information about students' learning. After about 3 minutes, use an **Attention Getting Signal**.

TEACHER SAY: **Wonderful work today, everyone. Tuck your circles into your student book and put your book away.**

 STUDENTS DO: Put circles in student book and put book away.

Lesson 102 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Use appropriate vocabulary to describe fractions.
- Investigate the attributes of halves, fourths, and thirds.

LESSON PREPARATION FOR THE TEACHER

Create a large chart to record information about fractions. See Chapter Preparation for the Teacher for detailed instructions and an example.

KEY VOCABULARY

- Denominator
- Equal parts
- Fourths
- Fraction bar
- Fractions
- Half
- Halves
- Numerator
- Quarters
- Thirds
- Whole

MATERIALS

- Calendar Math area
- Large fraction chart
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game to review math facts.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

Note to the Teacher: Today students continue to investigate fractions and expand their fraction vocabulary.

1. TEACHER DO: Display the large fraction circles you created in the last math lesson.

TEACHER SAY: In our last math lesson, we looked at ways to divide circles into equal parts. We looked at circles divided into unequal parts, too. We also learned that fractions are parts of a whole. And we took circle pies and divided them into halves, thirds, and fourths.

Turn and Talk to your Shoulder Partner about these three fraction circles. How many equal parts does each one have? What are the parts called? Give me a Thumbs Up when you are ready to share your thinking with the class.



STUDENTS DO: Turn and Talk to their **Shoulder Partner** about the fraction circles. Discuss the names and characteristics of each. Give a **Thumbs Up** when ready. Selected students share their thoughts with the class.

2. TEACHER DO: Display the large fraction chart.

TEACHER SAY: Let's create a table together to help us remember what we have learned about fractions. Think about the pies we folded in our last math session. First, we folded a circle to create equal parts for two friends to share. Raise your hand if you remember how to draw a line to show how two friends can share this equally.



STUDENTS DO: Selected students respond.

TEACHER SAY: Right. We draw a line down the middle of the circle. How many equal parts did we just make? Please count and clap and then say how many equal parts this circle has.



STUDENTS DO: Count 1, 2 while clapping. Say: 2.

TEACHER SAY: We clapped two times because there are two equal parts in this circle. Raise your hand if you remember what the fraction name for these parts is.



STUDENTS DO: Selected students respond.

TEACHER DO: Provide correct answer if needed (accept half or halves as an answer). Then write half and halves on the chart as the fraction in words.

TEACHER SAY: Now I am going to show you how to write this (point to one of the halves) as a fraction with numbers. Then I want you to Turn and Talk to your Shoulder Partner about what you notice about the number ½ and the picture one-half. Raise your hand when you are ready.

TEACHER DO: Write ½ (written vertically) on the chart for "Fraction in numbers." Also record ½ on ONE of the half pieces in the drawing at the top of the chart. The chart should look as shown.

Fraction in pictures and numbers	(circle divided in half, one half labeled ½)	(circle)	(circle)
Number of equal parts	2		
Fraction in words			
Vocabulary			



STUDENTS DO: Turn and Talk to a **Shoulder Partner** about halves. Raise hand when ready. Selected students share their thinking with the class.

TEACHER SAY: Many of you noticed that the bottom number is 2 and that there are two equal parts in this circle. Great job. You noticed the DENOMINATOR. The denominator is the bottom number in a fraction. Say denominator.

 **STUDENTS DO:** Say: denominator.

TEACHER SAY: Many of you also noticed that fraction numbers have a line in between the top and bottom numbers. This is called a FRACTION BAR. Say that with me.

 **STUDENTS DO:** Say: fraction bar.

TEACHER SAY: Many of you also noticed the top number, 1. The top number of the fraction is called the NUMERATOR. Say NUMERATOR.

 **STUDENTS DO:** Say: numerator.

TEACHER SAY: The numerator tells us how many parts we are focusing on. When we are looking at one part, we write a 1 as the numerator. Each part of this fraction is one of the two halves. We write one-half like this.

TEACHER DO: Write ½ on the second half of the circle at the top of the fraction chart.

TEACHER SAY: Each of these parts are halves. Each is half of the whole circle.

TEACHER DO: Write the vocabulary words on the fraction chart in the "Vocabulary" row: numerator, denominator, and fraction bar. The chart should look as shown.

Fraction in pictures and numbers	½ ½		
Number of equal parts	2		
Fraction in words	Half Halves		
Vocabulary	numerator, denominator, fraction bar		

3. TEACHER SAY: Let's look at another fraction. How did we make four equal parts of our pie? Raise your hand.

 **STUDENTS DO:** Raise their hand to answer. Selected students share their thinking.

TEACHER SAY: That is right. We fold the circle in half two times. That gave us four equal parts. What is another word we can use for four equal parts?

 **STUDENTS DO:** Say: fourths.

TEACHER SAY: Correct. Each of these parts is a fourth. Let's show this on our fraction chart.

TEACHER DO: Draw four equal parts on the circle on the fraction chart, record the number of equal parts, and write fourths for the fraction in words. The chart should look as shown.

Fraction in pictures and numbers	½ ½		
Number of equal parts	2	4	
Fraction in words	Half Halves	Fourths	
Vocabulary	numerator, denominator, fraction bar		

TEACHER SAY: Turn and Talk to your Shoulder Partner now to see if you can figure out how to write the fraction number for one of these equal pieces of the circle. Give me a Thumbs Up when you have an answer.

STUDENTS DO: Turn and Talk to **Shoulder Partner**. Give a **Thumbs Up** when ready. Selected students share their thinking with the class.

TEACHER DO: If no one indicates ¼, provide an explanation. Then record ¼ on the chart on each piece of the pie at the top. The chart should look as shown.

Fraction in pictures and numbers	½ ½	¼ ¼ ¼ ¼	
Number of equal parts	2	4	
Fraction in words	Half Halves	Fourths	
Vocabulary	numerator, denominator, fraction bar		

TEACHER SAY: There are a few ways we can explain these different parts. I am going to write some of them on the chart. We can write each part as ¼. Another name for fourths is quarters. So, instead of saying one-fourth, we could say one quarter. I am going to add that to the chart.

TEACHER DO: Add the word "quarters" under the word "fourths" in the chart.

4. TEACHER SAY: Finally, we tried to create three pieces of pie using our circle. This was a little bit more challenging.

TEACHER DO: Divide the final circle on the chart into thirds.

TEACHER SAY: Turn and Talk to your Shoulder Partner now to see if you can figure out the fractional name and the fraction number for this circle.


STUDENTS DO: Turn and Talk to **Shoulder Partner**.

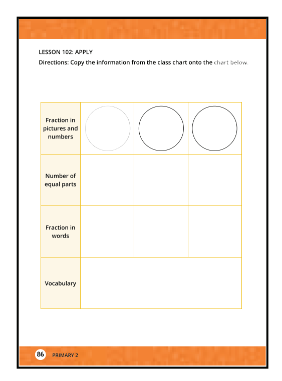
TEACHER SAY: I am going to use Calling Sticks to hear what you and your partner talked about.

TEACHER DO: Call on students one at a time to help fill in the chart for thirds.

TEACHER SAY: Right. Since we are only focusing on one of the equal parts of the circle, the numerator, the number on the top of the fraction bar, will be 1. The denominator is 3 because there are three equal parts, and the fraction is called one-third.

TEACHER DO: Fill in all information for one-third on the fraction chart. The completed chart should look as shown.

Fraction in pictures and numbers	½ ½	¼ ¼ ¼ ¼	1/3 1/3 1/3
Number of equal parts	2	4	3
Fraction in words	Half Halves	Fourths	Thirds
Vocabulary	numerator, denominator, fraction bar		



TEACHER SAY: Now I want you to record this information in your own chart. Turn to page Lesson 102: Apply in your Mathematics Student Book.

 **STUDENTS DO:** Open to page Lesson 102: Apply.

TEACHER SAY: See if you can fill in some of the chart without looking at our class chart. However, it is okay to look at the class chart. It is here for your reference if you need help remembering how to write something.

 **STUDENTS DO:** Complete the chart in their student book. Try to complete it on their own. Refer to the class chart as needed.

TEACHER DO: At the end of Learn time, use an **Attention Getting Signal**.

TEACHER SAY: If you did not finish, it is okay. I will leave our class chart up and you can finish at another time. You will need your student book for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students learned how to write and name halves, quarters, and thirds. During Reflect, they are challenged to consider the connection to telling time on analog clock. Students will share their thinking at the beginning of the next math lesson.



1. **TEACHER SAY: Turn to page Lesson 102: Math Journal in your Mathematics Student Book.**

STUDENTS DO: Turn to page Lesson 102: Math Journal in the student book.

TEACHER SAY: On this page, you see circles divided into halves and quarters and an analog clock. What connections can you make between these fractions and telling time? Think about what you have learned about fractions. Think about what you have learned about telling time. Then record your ideas on your Math Journal page. I will ask some of you to share your thinking in our next math lesson.

 **STUDENTS DO:** Record thoughts about connections between fractions and time.

TEACHER DO: At the end of the Reflect segment, use an **Attention Getting Signal**. Have students put away their student book.

 **STUDENTS DO:** Put away the books.

Lesson 103 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Investigate fractions with a numerator greater than 1. • Make connections between images of fractions and fraction names.	• Denominator • Equal parts • Fourths • Fraction bar • Fractions • Half • Halves • Numerator • Quarters • Thirds • Whole	• Calendar Math area • Completed fraction chart from Lesson 102 • Three large circles from Lesson 101 • Crayons • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
Current month

- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

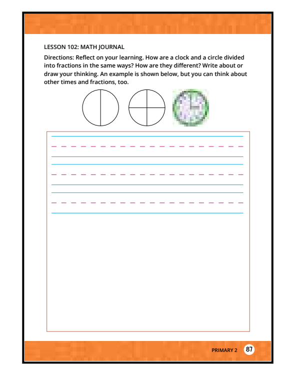
Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students begin by sharing their thinking about the connections between telling time and fractions of circles. They continue their exploration of fractions by investigating larger fractions (with numerators larger than one). If time permits, or if you desire, students can then put their fraction knowledge to the test by creating a fraction pizza using the correct fractions of ingredients.

1. TEACHER DO: Display the fraction chart you created in Lesson 102.

TEACHER SAY: We have been learning about fractions and have a lot of new words to use as mathematicians when we talk about equal parts of a whole. Turn to page Lesson 102: Math Journal in your Mathematics Student Book.


LESSON 102: MATH JOURNAL

Directions: Reflect on your learning. How are a clock and a circle divided into fractions in the same ways? How are they different? Write about or draw your thinking. An example is shown below, but you can think about other times and fractions, too.

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 **STUDENTS DO:** Open student book to page Lesson 102: Math Journal.

TEACHER SAY: In our last Reflect segment, you wrote about connections between telling time and the fractions we are learning about. Raise your hand if you would like to share your thinking.

 **STUDENTS DO:** Raise hand to volunteer. Selected students share their thinking.

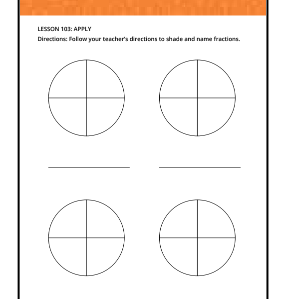
TEACHER SAY: Your ideas are so interesting. There is math all around us and sometimes things that do not seem connected are connected through mathematics. Thank you for sharing your ideas. Let's look at the numbers on our fraction chart. What do all of these fraction numbers have in common? Turn and Talk to your Shoulder Partner about what you notice.

 **STUDENTS DO: Turn and Talk** with a **Shoulder Partner** about what they notice.

TEACHER DO: Call on a few students. If no one identifies that the numerators are all 1 and the denominators are all different, be sure to point that out.

TEACHER SAY: When we wrote these fractions in our last math lesson, we discussed how each piece is one part of the whole. This circle (point to the circle with fourths) has four equal pieces, and one piece is one-fourth of the whole circle. We can write one-fourth as 1 over 4.

TEACHER DO: Write ¼ on the board. Then draw four large circles on the board. Draw lines to divide each circle into four equal pieces.


LESSON 103: APPLY

Directions: Follow your teacher's directions to shade and name fractions.

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2. TEACHER SAY: Today we are going to spend some time discovering what it means when the numerator is a number other than 1. Let's explore this with a circle divided into fourths. Turn to page Lesson 103: Apply in your book.

 **STUDENTS DO:** Turn to page Lesson 103: Apply in the student book.

TEACHER SAY: There are four circles on the page. How many pieces is each circle divided into?

 **STUDENTS DO:** Call out: 4.

TEACHER SAY: Yes. Four equal pieces. The circles are divided into fourths. Let's color in one of the parts on the first circle.

 **STUDENTS DO:** Color in one-fourth of the first circle on the page.

TEACHER DO: Shade in one-fourth of your circle on the board. Monitor and correct students if needed.

TEACHER SAY: Great job. We just colored in one-fourth, or one out of the four equal parts in this circle. Let's write ¼ underneath.

 **STUDENTS DO:** Write ¼ under their circle.

TEACHER DO: Write ¼ under your circle.

TEACHER SAY: Great. Look at the second circle. Color in two pieces of that circle.

 **STUDENTS DO:** Color in two pieces of the second circle.

TEACHER DO: Shade in two pieces of your second circle.

TEACHER SAY: Think about what we did and see if you can figure out what we should call this new fraction. Do not write it yet. Just think for a moment.

 **STUDENTS DO:** Think about what the fraction would be.

TEACHER SAY: I would like to hear some of your ideas, so I will use the Calling Sticks.

 **STUDENTS DO:** Selected students share their thinking.

Note to the Teacher: If no one says two out of four or two-fourths, or notices that the new fraction is half of the circle, use questions to prompt students to identify each point.

TEACHER SAY: You are so smart. We colored in two of the four equal pieces, so we could write this as 2 out of 4 , or $\frac{2}{4}$. We also noticed that this is now half of our whole circle. That is so interesting. I am going to write the name of this new fraction on the board under my circle. You write it in your book.

TEACHER DO: Write $\frac{2}{4}$, underneath your second circle.

 **STUDENTS DO:** Write $\frac{2}{4}$ underneath their second circle.

TEACHER SAY: Wonderful. Let's color in three pieces of our third circle and write the fraction underneath it.

 **STUDENTS DO:** Color three pieces of their third circle and write ¾ underneath it.

TEACHER DO: Shade in three pieces of your third circle. Ask for a student volunteer to write the fraction under your circle.

 **STUDENTS DO:** Selected student writes ¾ under the third circle on the board.

TEACHER SAY: Great job. Now that we have three out of four pieces colored in, we can write this fraction as 3 over 4. Please make sure you have recorded this correctly in your student book.

 **STUDENTS DO:** Make sure they have the correct answer written in their book.

TEACHER SAY: Are you ready? We only have one circle left to color in. Let's color in all four pieces of your last circle. Then, record the fraction. This is a little tricky, so be sure that your numerator shows the number of pieces you have colored in and your denominator shows how many pieces there are in the whole circle.

 **STUDENTS DO:** Color in all four pieces of their last circle and write $\frac{4}{4}$ underneath it.

TEACHER SAY: Raise your hand if you would like to come to the board to color and show us the fraction number you wrote.

 **STUDENTS DO:** Raise hand to volunteer. Selected student writes $\frac{4}{4}$ on the board under the last circle.

TEACHER SAY: Wow, that was really interesting. We colored in the whole circle and instead of writing one whole.

TEACHER DO: Write 1 on the board under the last circle.

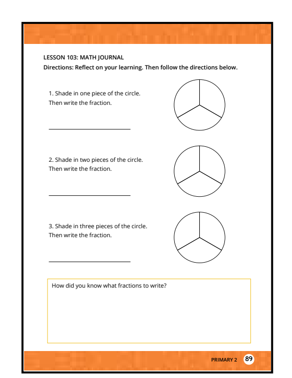
TEACHER SAY: Instead we wrote $\frac{4}{4}$. This fraction has 4 as the numerator and 4 as the denominator. It means we colored in four out of the four parts of this circle, or the whole circle. Great work today.

Note to the Teacher: As an extension activity for students who need additional practice, repeat this lesson with thirds and halves. Additionally, in the student book on page Lesson 103: Extension, there are directions for students to create a Fraction Pizza. If students understand the concept of $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ easily, they can work on this activity either independently, with a partner, or for homework. If you do this activity, encourage students to compare their pizza creations with each other.



Reflect (5 minutes)

Directions



LESSON 103: MATH JOURNAL

Directions: Reflect on your learning. Then follow the directions below.

1. Shade in one piece of the circle. Then write the fraction.

2. Shade in two pieces of the circle. Then write the fraction.

3. Shade in three pieces of the circle. Then write the fraction.

How did you know what fractions to write?

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Note to the Teacher: Today students investigated what happens to the numerator as more pieces of the whole are shaded. For Reflect, they try to generalize this idea and apply their new learning to another fraction.

1. TEACHER SAY: Turn to page Lesson 103: Math Journal in your student book.

STUDENTS DO: Turn to page Lesson 103: Math Journal.

TEACHER SAY: Today we explored fractions where the numerator is not 1. Reflect on what you learned. Then complete the activity on your Math Journal page. At the end of the activity is a question: How did you know what fraction to write? When you are finished with the circle part of the activity, answer the question.



STUDENTS DO: Reflect on their learning. Complete the fraction activity and answer the question in their book.

TEACHER DO: Walk around and observe students as they work. Take note of students who are not able to complete the activity correctly or explain their reasoning. If time allows, go over the answers together and have students share their thinking with the class. Be sure to review students' work to check their understanding.

TEACHER SAY: Fantastic work today. Put away your student book and give yourself a pat on the back.



STUDENTS DO: Put away their book and pat themselves on the back.

Lesson 104 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Identify multiple ways to divide a rectangle into fractional parts.
- Make connections between images of fractions and fraction names.

LESSON PREPARATION FOR THE TEACHER

Collect blank copy paper (one sheet per student).

Gather rulers (one per small group of students).

KEY VOCABULARY

- Denominator
- Equal parts
- Fourths
- Fraction bar
- Fractions
- Half
- Halves
- Numerator
- Quarters
- Thirds
- Whole

MATERIALS

- Calendar Math area
- Blank copy paper (one sheet per student)
- Rulers (one per small group of students)
- Fraction Wall poster
- Crayons (each student needs red, green, yellow, and blue)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

Note to the Teacher: So far in this chapter, students have learned about fractions using circles. Today they explore fractions in rectangles and apply their learning to this new model.

1. TEACHER SAY: **Let's play Show What You Know to review what we know about fractions in circles. You are going to find a partner using Hands Up, Pair Up.**

 STUDENTS DO: Use **Hands Up, Pair Up** to find a partner.

TEACHER SAY: **I will draw an image of a fraction on the board. Tell your partner everything you know about that fraction.**

TEACHER DO: Draw a fraction circle on the board with ¾ colored.

 STUDENTS DO: Play Show What You Know.

TEACHER DO: Have students find a new partner.

 STUDENTS DO: Use **Hands Up, Pair Up** to find a partner.

TEACHER DO: Draw a fraction circle on the board with ½ colored.

 STUDENTS DO: Play Show What You Know.

TEACHER DO: Play two more rounds using fraction images for ⅔ and 2/4.

2. TEACHER SAY: **Fractions are not only found in circles. I am going to give each of you a blank piece of paper.**

TEACHER DO: Hand out one blank sheet of paper to each student.

TEACHER SAY: **What shape is this paper?**

 STUDENTS DO: Say: rectangle.

TEACHER SAY: **Today we are going to learn about fractions using a rectangle. I am going to put you into groups of three using Count Off. Take your sheet of paper and a pencil with you to meet your group.**

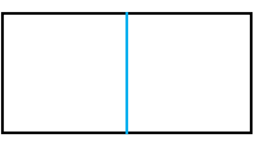
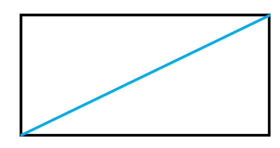
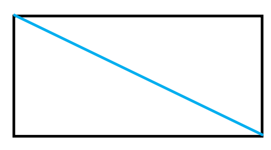
 STUDENTS DO: Get into groups using **Count Off**. Take their paper and pencil with them.

TEACHER DO: Hand out a ruler to each small group.

TEACHER SAY: **In your groups, you have three pieces of paper all together. I want you to take one of the pieces of paper and draw a line to show two equal parts on the rectangle. The ruler will help you draw a straight line. Be creative. If you finish quickly, try to find another way to show two equal parts. There are several solutions.**

 STUDENTS DO: Work with their group to find a way to create two equal parts on the rectangle.

TEACHER DO: Give students 2 to 3 minutes to discuss and find a way to divide the rectangle into two equal parts. Then select groups to share their discovery and draw the different ways on the board. Be sure the following are included:

 **STUDENTS DO:** Selected students show their work at the board.

Note to the Teacher: The last two are more challenging because in each rectangle, the two pieces are not mirror images of one another. Help the students recognize that if they cut the pieces out, they would be able to fit them together. If necessary, create an example to show the students.

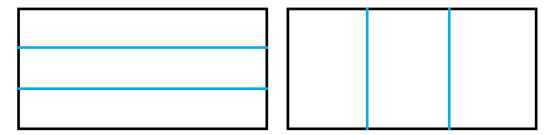
TEACHER SAY: Each of these has two equal parts. What word can we use to describe these? Pop up to answer.

 **STUDENTS DO:** Pop up to answer: halves.

TEACHER SAY: There are a lot of ways to show halves with the rectangle. Using another sheet of paper, work with your group to draw lines so there are three equal parts on the rectangle.

 **STUDENTS DO:** Work with their team to find a way to create three equal parts on the rectangle.

TEACHER DO: Give students 2 to 3 minutes to talk and find a way to divide the rectangle into three equal parts. Then select groups to share their discovery and draw the different ways on the board. Be sure the following are included:



 **STUDENTS DO:** Selected students show their work at the board.

TEACHER SAY: These have three equal parts. What word can we use to describe these? Pop up to answer.

 **STUDENTS DO:** Pop up to answer: thirds.

TEACHER SAY: Great work. With your last piece of paper, work with your group to create four equal parts on the rectangle.

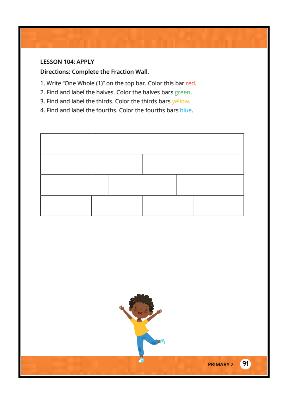
 **STUDENTS DO:** Work with their group to find a way to create four equal parts on the rectangle.

TEACHER DO: Give students 2 to 3 minutes to discuss and find a way to divide the rectangle into four equal parts. Then select groups to share their discovery and draw the different ways on the board. Be sure the following are included:

 **STUDENTS DO:** Selected students show their work at the board.

TEACHER SAY: These have four equal parts. What words can we use to describe these? Pop up to answer.

 **STUDENTS DO:** Pop up to answer: fourths, quarters.

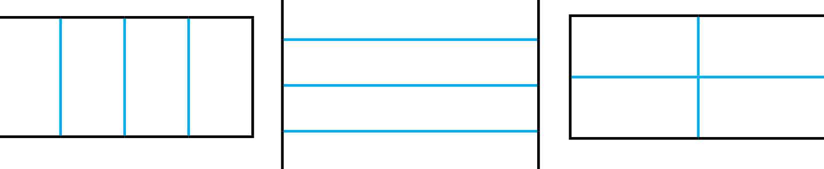

LESSON 104: APPLY

Directions: Complete the Fraction Wall.

1. Write "One Whole (1)" on the top bar. Color this bar red.
2. Find and label the halves. Color the halves bars green.
3. Find and label the thirds. Color the thirds bars yellow.
4. Find and label the fourths. Color the fourths bars blue.

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3. TEACHER SAY: Good job, class. We are going to use what we just learned about equal parts in a rectangle to create a Fraction Wall in our Mathematics Student Book. The Fraction Wall helps us break down these fractions. Turn to page Lesson 104: Apply in your Mathematics Student Book.



 **STUDENTS DO:** Turn to page Lesson 104: Apply in the Mathematics Student Book.

TEACHER SAY: **In your student book, you see an empty Fraction Wall. We will fill in part of it together and you will finish it on your own.**

TEACHER DO: Display your large Fraction Wall poster.

TEACHER SAY: **Let's look at the bricks of our wall.**

TEACHER DO: Point out the long rectangles on the Fraction Wall.

TEACHER SAY: **Look at the top rectangle. Is it divided into equal parts?**

 **STUDENTS DO:** Say: no.

TEACHER SAY: **Yes, this rectangle is not divided into equal parts. It is whole. Say whole.**

 **STUDENTS DO:** Say: whole.

TEACHER SAY: **One whole is the same as 1. One is a whole number and not a fraction. If I gave you one whole cookie, then you have 1 cookie. Let's write One Whole and 1 in the top rectangle.**

TEACHER DO: Write One Whole (1) in the top rectangle on the Fraction Wall.

 **STUDENTS DO:** Write One Whole (1) in the top rectangle on the Fraction Wall.

<table>
<tr><td colspan="12">One Whole (1)</td></tr>
<tr><td colspan="6"></td><td colspan="6"></td></tr>
<tr><td colspan="4"></td><td colspan="4"></td><td colspan="4"></td></tr>
<tr><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td></tr>
</table>

TEACHER SAY: **Great job. Look at the rows beneath the top row. Each row is divided into equal parts.**

TEACHER DO: Point to the second, third, and fourth rows and make sure students understand that the second row is divided into two equal parts, the third row is divided into three equal parts, and the fourth row is divided into four equal parts.

TEACHER SAY: **But the whole row is the same length as the other three rows. What do you think that means?**

 **STUDENTS DO:** Raise hand to answer. Selected students share their thinking.

TEACHER SAY: **That is right. Each row is equal to one whole. But each is divided into different fractions of equal parts. If the top rectangle is the whole, let's figure out how to label the next row. How many parts are there?**

 **STUDENTS DO:** Say: two.

TEACHER SAY: **There are two equal parts. What do we call these parts?**

 **STUDENTS DO:** Say: halves.

TEACHER SAY: **Right. Let's write ½ on each equal part. The denominator is 2 because there are two equal parts. The numerator is 1 because each piece we are labeling is one piece.**

 **STUDENTS DO:** Write ½ on each equal part on the Fraction Wall.

TEACHER DO: Write ½ on each equal part of the Fraction Wall.

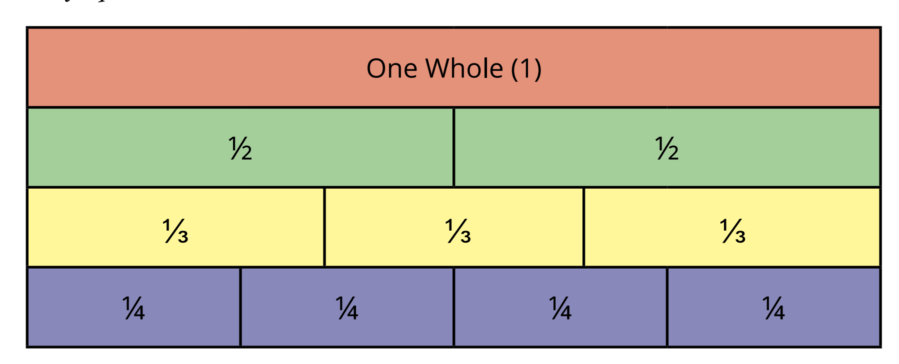
4. TEACHER SAY: You are going to finish writing the fractions on the bricks of the Fraction Wall. Find the denominator by counting the number of equal pieces in the row. Label the equal parts. Then follow the rules for coloring the Fraction Wall.

 **STUDENTS DO:** Complete the Fraction Wall in their Mathematics Student Book.

TEACHER DO: As students are working, walk around and check their progress. Help students who need additional support or instruction. When students are finished, ask volunteers to help you complete the Fraction Wall on the large poster so everyone can check their work.

 **STUDENTS DO:** Selected students show their work on the large poster.

Note to the Teacher: Make sure students understand that when all of the bricks in each row are colored ($\frac{2}{2}$, $\frac{3}{3}$, and $\frac{4}{4}$), they equal one whole (1). Point out the correct colors or write the color next to each rectangle.



TEACHER SAY: We sure have used our math brains a lot to help us learn about fractions. Great work. Keep your Mathematics Student Book open for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students think about patterns they have observed during work with fractions and share their thinking with others.

1. TEACHER SAY: Your Fraction Walls look great. I want you to think about your Fraction Wall and everything you have learned about fractions. What patterns have you seen? What have you noticed? Think for a moment, then share your thinking with your Shoulder Partner. In a few minutes, I will use Calling Sticks to select some of you to share your thinking with the class.

 **STUDENTS DO:** Reflect on their learning. Think about patterns they have seen and things they have noticed while working on fractions. Share their thinking with their **Shoulder Partner**. Selected students share their thinking with the class.

TEACHER DO: If necessary, ask questions to prompt students' thinking, such as the following:

- What happens to the size of the parts as the rows are cut into more pieces?
- What fractions are equal to each other?

TEACHER SAY: You all did a wonderful job today. You may away put your book and crayons.

 **STUDENTS DO:** Put away their materials.

Lesson 105 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Create fractions using word or number clues.

LESSON PREPARATION FOR THE TEACHER

Print sets of Build-a-Fraction Cards (one set per small group of students). See Build-a-Fraction Cards Blackline Master.

KEY VOCABULARY

- Denominator
- Equal parts
- Equivalent fractions
- Fourths
- Fractions
- Half
- Halves
- Numerator
- Quarters
- Thirds
- Whole

MATERIALS

- Calendar Math area
- Build-a-Fraction Cards (one set per small group of students)
- Crayons
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

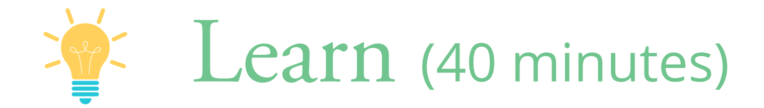
TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.



Learn (40 minutes)

Directions

Note to the Teacher: Today students create fractions using both circles and rectangles. They pick a Fraction Card and color a fraction circle or rectangle in the Mathematics Student Books to match the card. This activity assesses students' ability to read and create fractions.

1. TEACHER SAY: **We have been learning so much about fractions. Turn and tell your Shoulder Partner two things you learned in our last math lesson about fractions. I will use Calling Sticks to select some of you to share your thinking with the class.**

 STUDENTS DO: Turn and Talk to their Shoulder Partner about what they learned in the last math lesson about fractions. Selected students share their learning with the class.

TEACHER SAY: **Our math brains also learned a lot of new math vocabulary this week. Let's review some of these terms. I am going to call out a fraction. I want you to show me on your fingers how many equal parts that fraction has. One-third.**

 STUDENTS DO: Hold up 3 fingers.

TEACHER SAY: **Yes, remember, when we say thirds, it means that there are three equal parts. The total number of equal parts of the whole is also called the denominator. Show me on your fingers the denominator of two-fourths.**

 STUDENTS DO: Hold up 4 fingers.

TEACHER SAY: **How do we say the fraction with a numerator of 1 and a denominator of 2? Wave at me if you know.**

 STUDENTS DO: Wave if they know. Selected student answers the question.

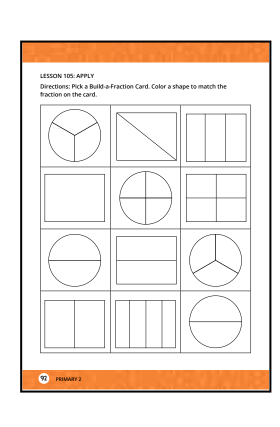
TEACHER SAY: **How do we say the fraction with a numerator of 3 and a denominator of 4? Put your finger on your nose if you know.**

 STUDENTS DO: Put their finger on their nose if they know. Selected student answers the question.

2. TEACHER SAY: **Today you are going to play a game called Build-a-Fraction. I am going to put you into groups of four using Count Off. You will need your Mathematics Student Book and some crayons.**

TEACHER DO: Put students into groups of four using Count Off.

 STUDENTS DO: Get into groups, taking the student book and crayons with them.



TEACHER SAY: **Turn to page Lesson 105: Apply in your Mathematics Student Book.**

 STUDENTS DO: Turn to page Lesson 105: Apply in the Mathematics Student Book.

TEACHER DO: Hand out sets of Build-a-Fraction Cards (one set to each small group).

TEACHER SAY: **You will share the Build-a-Fraction Cards with your group but work independently. Each of you will pick a card and read the fraction. Then you will look at the chart of fraction circles and rectangles in your book. Find one that has the same denominator (or equal parts of the whole) and color it to match the Build-a-Fraction Card. You can use any color you like. Let's do a practice one together.**

TEACHER DO: Draw the following on the board: a rectangle with three equal parts, a rectangle with four equal parts, and a circle with four equal parts.

TEACHER SAY: For example, if I draw a card that says ¼, which of these shapes could I pick? Raise your hand to share.

 **STUDENTS DO:** Raise hand to share. Selected students share their thinking.

TEACHER SAY: That is right. My denominator is 4, so I am looking for a shape with four equal parts. I can use either the circle or the rectangle divided into four pieces. How many parts should I color?

 **STUDENTS DO:** Raise hand to share. Selected students share their thinking.

TEACHER SAY: Yes. I should color one part. Since the numerator in the fraction is one, I color one equal part.

TEACHER DO: Use **Calling Sticks** to select a student to color ¼ on the board.

 **STUDENTS DO:** Selected student colors ¼ on one of the shapes on the board.

3. TEACHER SAY: Now it is your turn. Remember, you are working on your own. There is one card that says, "You decide." If you pick this card, you get to decide what fraction you would like to create. You may begin.

 **STUDENTS DO:** Pick cards and create fraction circles and rectangles to match the fractions shown on the cards.

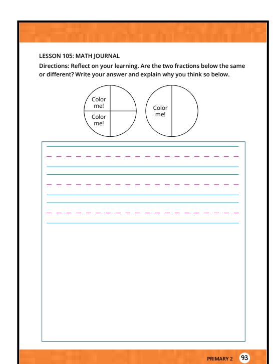
TEACHER DO: Give students time to complete the activity. Walk around the classroom and offer help as needed. Take note of students who are struggling with the activity. Have those students work with a partner.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students applied their understanding of fractions by creating fraction circles and rectangles. Students extend their thinking about fractions by looking at two equivalent fractions and considering whether they are the same or different. At this point, they have not been introduced to the concept of equivalent fractions or the vocabulary.



LESSON 105: MATH JOURNAL

Directions: Reflect on your learning. Are the two fractions below the same or different? Write your answer and explain why you think so below.

Color me! Color me! Color me!

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1. TEACHER SAY: Turn to page Lesson 105: Math Journal in your student book.

 **STUDENTS DO:** Turn to page Lesson 105: Math Journal.

TEACHER SAY: There are two fractions on the page. Look at them. Are they the same or different? Think for a moment. Then write your answer and explain your thinking on your Math Journal page.

 **STUDENTS DO:** Think about the two fractions. Record an answer to the prompt including reasoning.

TEACHER DO: As students work, walk around and read some of their entries. Read as many entries as possible to get a sense of students' preliminary understanding of equivalent fractions.

Note to the Teacher: It is not expected that students completely understand (or are even aware of) equivalent fractions at this time. This activity provides insight into which students have advanced understanding of fractions.

TEACHER SAY: Great work with fractions, class. You may put away your book and crayons.

 **STUDENTS DO:** Put away their materials.

Lesson 106 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Identify numbers as even or odd.
- Name all fractional parts for halves, thirds, and fourths.

LESSON PREPARATION FOR THE TEACHER

Create a poster showing various fractions. See Chapter Preparation for the Teacher for detailed instructions.

Make sets of 30 counters (one set for each group).

Gather one die for each small group of students.

KEY VOCABULARY

- Even
- Fourths
- Fraction
- Half
- Halves
- Odd
- Thirds
- Whole

MATERIALS

- Calendar Math area
- Fraction poster
- Dice (one die for each small group of students)
- Sets of 30 counters (one set per small group of students)
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students review identifying fractions of a whole by playing a board game in groups of 4 or 5. Students need a lot of practice with fractions to gain confidence and proficiency.

1. TEACHER DO: Display the fraction poster you created.

TEACHER SAY: We have been exploring a lot of fractions these past few math classes. Today we are going to put all of that together and play a game to check our understanding. First, let's review what a fraction is. On the board are some drawings. Turn to your Shoulder Partner and talk about which of these drawings show fractions, what fractions they show, and how you explain what a fraction is. In a minute, I will use Calling Sticks to hear what you discussed.



STUDENTS DO: Turn and Talk to their **Shoulder Partner** about the fractions on the board. Selected students share what they discussed.

TEACHER DO: Record what students state about the names of the fractions, what a fraction is, and why the one drawing is not in fact an image of a fraction because the parts are not equal. If no students states that the ¼ image is incorrect, ask questions to guide the discussion.

TEACHER SAY: Nice work. Three of these drawings show fractions. One of them does not because we have learned that fractions have to be equal parts of a whole. This drawing has four parts with one part colored in, but the parts are not equal. Let's look at the other images.

TEACHER DO: Point to the fraction that shows ⅓.

TEACHER SAY: Instead of holding up fingers like we have before, today clap for the number of equal parts this circle has.



STUDENTS DO: Clap three times.

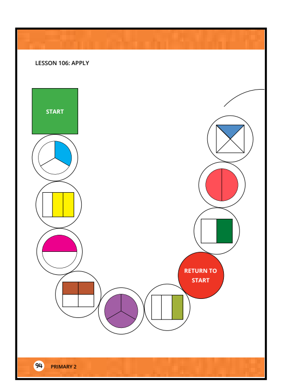
TEACHER SAY: Yes, this whole circle has three equal parts. In our last math class, you practiced coloring in fractions, but now Lean and Whisper how many parts are already colored in.



STUDENTS DO: Lean and Whisper: one.

TEACHER SAY: Great. This fraction has three equal parts and one is already colored in. It shows ⅓.

TEACHER DO: Write ⅓ on the board next to the fraction drawing. Repeat the process for ¾ and 2/2, having students clap the number of equal parts and then **Lean and Whisper** the parts colored in. Be sure to explain that 2/2 makes a whole since there are two parts and both are colored.



2. TEACHER SAY: Great review. Now let's play a board game. Open your Mathematics Student Book to page Lesson 106: Apply.



STUDENTS DO: Open the Mathematics Student Book to page Lesson 106: Apply.

TEACHER SAY: This is a game board. In this game, you travel down a bike path. You will play in small groups, so only one of you will need to take your student book to play. All players start at the top of the game board and roll the die to move along the path. If you roll an even number, you move two spaces forward. If you roll an odd number, you move one space forward. The object of the game is to get to the end of bike path with the most counters.

TEACHER DO: Hold up one 6-sided die.

TEACHER SAY: This die has numbers 1, 2, 3, 4, 5, and 6 on it. Lean and Whisper the even numbers on this die.



STUDENTS DO: Lean and Whisper: 2, 4, 6.

TEACHER DO: Record on board: Even: 2, 4, 6 – move two spaces.

TEACHER SAY: What are the odd numbers on this die? Lean and Whisper.

 **STUDENTS DO: Lean and Whisper**: 1, 3, 5.

TEACHER DO: Record on board: Odd: 1, 3, 5 – move one space.

TEACHER SAY: Good. When you land on a space, say the fraction. The rest of the group needs to agree that you said the fraction correctly. If you are correct, you get a counter. If you are incorrect, you do not. Play the game until all players get to the end of the path. The player with the most counters wins. If there is time left, you can play again. I will use Calling Sticks to create groups of four or five. After a group is called, come and get one die and a cup/bag of counters. Are there any questions?

 **STUDENTS DO:** Ask questions if needed.

TEACHER DO: Answer questions to clarify the directions. Use **Calling Sticks** to create groups of four or five 5, depending on numbers in the class. Hand out one die and a set of counters to each group.

 **STUDENTS DO:** When their group is called, collect supplies and find a place to play in the room. Play the game for the rest of Learn time.

TEACHER DO: Walk around and observe students playing. Note which students are having difficulty identifying fractions. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: Good work today identifying fractions. Bring the materials back to the front and return to your seats. You will need your student book for Reflect.

 **STUDENTS DO:** Put away supplies and return to seats.

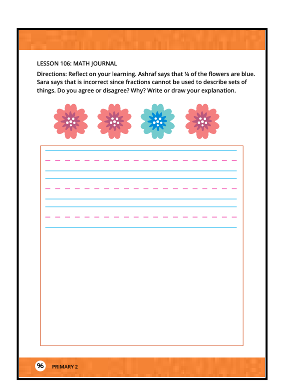


Reflect (5 minutes)



Directions

Note to the Teacher: In today's lesson, students played a game to review what they have learned about fractions. As a preview of the next math lesson, students look at an image of four flowers and reflect on whether fractions can refer to parts of a group (rather than parts of a whole).



LESSON 106: MATH JOURNAL

Directions: Reflect on your learning. Ashraf says that ¼ of the flowers are blue. Sara says that is incorrect since fractions cannot be used to describe sets of things. Do you agree or disagree? Why? Write or draw your explanation.

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1. **TEACHER SAY: Turn to page Lesson 106: Math Journal in your student book.**

 **STUDENTS DO:** Turn to page Lesson 106: Math Journal.

TEACHER SAY: On this page, you see a picture of some flowers and a story. Ashraf looked at this picture and said that ¼ of the flowers are blue. Sara said that this cannot be right because fractions cannot be used to describe sets of things. Reflect on your learning and decide if you agree with Ashraf or Sara. Write in your book who you agree with and why.

 **STUDENTS DO:** Reflect on their learning and think about the image and story. Respond to the prompt in their book.

TEACHER DO: As students work, walk around and read some of their entries. Take note of students who have an advanced understanding of fractions.

TEACHER SAY: We will talk more about fractions and this question in our next math class. Put away your book and pencil for today.

 **STUDENTS DO:** Put away materials.

Lesson 107 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Identify and write fractional parts of a set.
- Compare fractions of a whole and of a set.

KEY VOCABULARY

- Fourths
- Fraction
- Half
- Halves
- Set
- Thirds

MATERIALS

- Calendar Math area
- Large version of the image on page Lesson 106: Math Journal of the Mathematics Student Book
- Cups with four two-sided counters (one cup per pair of students)
- Number Cards 0–9 (one set per pair of students)
- Red crayon (one per student)
- Student Mathematics Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create a large version of the flower image on page Lesson 106: Math Journal of the Mathematics Student Book.

Print sets of 2-sided counters (4 counters per pair of students). Put counters in plastic cups. See the Two-Sided Counters Blackline Master.

Create (or have available) sets of Number Cards 0–9 (one set per pair of students). See the Number Cards Blackline Master. (Students will use only numbers 2, 3, and 4.)



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

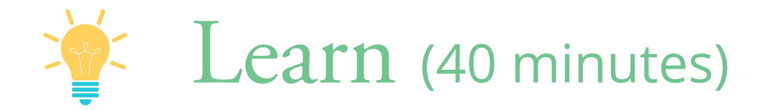
TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students explore fractions of a set. They shake and spill 2 to 4 counters and record the fraction of shaded counters in the set. This lesson references printed two-sided paper counters as shaded/white, but adjust the language to match the materials you are using.

1. TEACHER DO: Draw a rectangle and circle model of fourths on the board with ¼ colored in.

TEACHER SAY: In our last math class, we reviewed fractions of a whole and played a game. On the board, there are two images of fractions similar to ones we have discussed before. Pop up if you think that both show the same fraction.

 **STUDENTS DO:** Pop up if both images are the same fraction.

TEACHER DO: Call on a student who is standing to explain why both models show ¼.

TEACHER SAY: Good. Both of these images show ¼. In our last math lesson during Reflect, you saw a picture of four flowers. One of them was colored blue and the other three were colored red.

TEACHER DO: Display your large version of the four flowers in the student book.

TEACHER SAY: This a group of flowers. One of the four flowers is blue. The other three flowers are red. Clap if you thought that Ashraf was correct and that this is another example of ¼.

 **STUDENTS DO:** Clap if they agree that the picture shows ¼.

TEACHER SAY: This is a group of flowers. This is what mathematicians call a SET. It is a set of flowers.

TEACHER DO: Put a box around the whole group of flowers on the board.

TEACHER SAY: This group of flowers that I boxed is the whole, like the circle or the rectangle was the whole. This is a set of the same things—lowers. There are four flowers, and one is blue, so just like the model of the circle and the rectangle that had one of the four equal parts shaded, this set of the same things—flowers—has one of the four that is blue. What fraction of this set of flowers do you think are red? Turn to your Shoulder Partner and discuss. Give me a Thumbs Up when done.

 **STUDENTS DO: Turn and Talk** to **Shoulder Partner** about the fraction of flowers that are red. Give a **Thumbs Up** when finished. Selected students share their thinking.

TEACHER DO: Record the answer on the board: ¾ of the flowers are red. Circle the group of red flowers within the box that you already drew around the whole group.

TEACHER SAY: Good. The set has four flowers and three are red. ¾ of the flowers are red. ¼ of the flowers are blue. I put a box around the whole group and then circled the red flowers to show the fraction that are red. Fractions can be part of a whole object like a circle or rectangle or part of a set, like these flowers. Let's try another one, but this time I am going to create a set of students. If I call your name, come to the front of the room.

2. TEACHER DO: Call up two girls and one boy to the front of the class. Have them stand in a line.

TEACHER SAY: Here we have a set of students. Clap how many students we have in this group.

 **STUDENTS DO:** Clap three times.

TEACHER SAY: Yes, this set has three students. In our last math class, we clapped to state how many equal parts there were in the circles or rectangles. That told us our denominator. Today

we made a set and can see that we have three students. If we want to say what fraction of this group of students is girls, how would we say that? Turn to your Shoulder Partner and discuss. Give me a Thumbs Up when you are ready to share.



STUDENTS DO: Turn and discuss with **Shoulder Partner** the fraction of the set that are girls. Give a **Thumbs Up** when ready to share. Selected students answer and explain their thinking.

TEACHER DO: Record the answer on the board and be sure to model how to write and read $\frac{2}{3}$. Ask students to explain how they know the denominator is 3 and the numerator is 2.



STUDENTS DO: Selected students explain how they know the denominator is 3 and the numerator is 2.

TEACHER SAY: **What fraction of this set are boys? Raise your hand if you know.**



STUDENTS DO: Raise hand to volunteer. Selected students answer the question.

TEACHER DO: If time allows, call up another set of students. This time call up four with a different number of girls and boys. Repeat the process, clapping for how many students in the set and then asking what fraction are girls or boys or a different question, such as What fraction of the set are wearing shorts/skirts/stripes/sandals (and so on)?

3. TEACHER SAY: **What part of the fraction changes when the part of the set we are focusing on changes?**

Note to the Teacher: Fractions of a set is challenging for many students. It is important that they understand that the group of items is the whole and that, as with a circle or rectangle model, the equal parts are the individual parts of the set. Provide a lot of practice with fractions of a set. Using sets of students not only helps students build understanding of fractions of a set, but also fosters community and improves observation skills. This quick activity can be done at any time during the day, even outside of math time.

TEACHER SAY: **Good job. We are going to practice identifying fractions of a set using some two-sided counters. One side of the counter is shaded and the other side is white. I play by picking a number card and putting that many counters in my cup. This will be my set of objects.**

TEACHER DO: Using the 2, 3, and 4 number cards, select one and place that many counters in the cup.

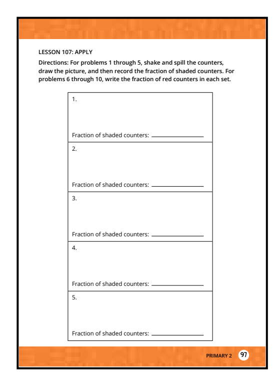
TEACHER SAY: **I have _____ (number on card) counters in my cup, or in my set. Now I shake up the counters and pour them out in front of me. Next I count the number that are shaded.**

TEACHER DO: Shake the cup and spill the counters out and count the number of shaded ones.

TEACHER SAY: **I had _____ (number on card) counters in the cup and _____ counters are shaded. What fraction can I write to show the number of shaded counters in this set? Lean and Whisper.**



STUDENTS DO: **Lean and Whisper**: $\frac{2}{3}$, for example, if three counters were in the cup and two were shaded.



LESSON 107: APPLY

Directions: For problems 1 through 5, shake and spill the counters, draw the picture, and then record the fraction of shaded counters. For problems 6 through 10, write the fraction of red counters in each set.

1. Fraction of shaded counters: ______
2. Fraction of shaded counters: ______
3. Fraction of shaded counters: ______
4. Fraction of shaded counters: ______
5. Fraction of shaded counters: ______

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TEACHER SAY: **Yes, I had _____ (number on card) counters in my cup and _____ were shaded, so I can write _____ (answer) for the fraction of my set that were shaded. Remember that the total number of parts, or objects, is the denominator of my fraction and the number of shaded ones is the numerator.**

TEACHER DO: Write the fraction on the board.

TEACHER SAY: **Now it is your turn. Take out your Mathematics Student Book and turn to page Lesson 107: Apply.**



STUDENTS DO: Take out Mathematics Student Book and turn to page Lesson107: Apply.

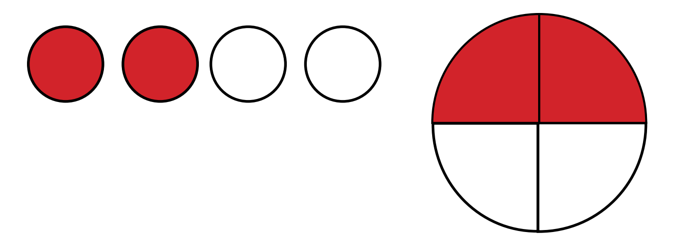
TEACHER SAY: **On the first page, for problems 1 through 5, you will pick a number card, put that many counters in your cup, and shake the cup and spill out the counters. Write a fraction for the number of shaded counters in the set. For problems 6 through 10, there are counters on the page. Write a fraction for the number of red counters in the set.**

TEACHER DO: Make sure students understand the directions.

TEACHER SAY: **You will play with your Shoulder Partner. Decide which of you will come up to get the materials. You need a cup with counters, number cards, and a red crayon. Let's get started.**

 **STUDENTS DO:** Selected students retrieve materials. Partners share the materials and complete the activity.

Note to the Teacher: As an extension activity, students who need an extra challenge can place more than four counters in the cup to represent fractions other than halves, thirds, and fourths. They can also sketch the set. For additional practice, they can then draw a model of the same fraction as a fraction of a circle or rectangle. See the example below.



TEACHER DO: Walk around and observe students as they work. Take note of students who need additional support as well as those who need extension so you can provide appropriate challenge to all. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Nice work today recording and identifying fractions of a set. I would like the partner who did not pick up the materials to bring them back to me. Put away your Student Mathematics Book.**

 **STUDENTS DO:** Return supplies to the teacher and put away student book.

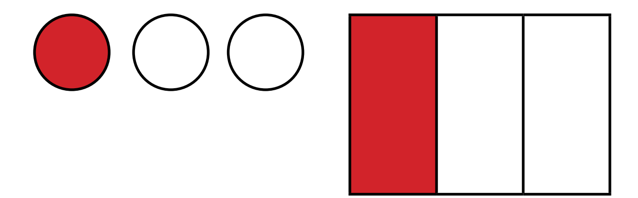
Reflect (5 minutes)

Directions

Note to the Teacher: Today students practiced identifying fractions of a set. For Reflect, students compare two images—one showing a fraction of a whole and one showing fractions of a set. They discuss how these two are similar and different.

1. TEACHER SAY: **Today you explored a different way to think about fractions—fractions of a set. I am going to draw two pictures on the board.**

TEACHER DO: Draw the following on the board:



TEACHER SAY: **One of these pictures is an example of a fraction of a whole and one is an example of a fraction of a set. Think about how these two fractions are the same and different. Turn to your Shoulder Partner and share your thinking. In a few minutes, I will use the Calling Sticks to hear from a few of you.**

 STUDENTS DO: Talk to **Shoulder Partner** about the two images. Selected students share what they discussed.

TEACHER DO: Take note of which students have a strong understanding of fractions and which do not. Clarify major misconceptions.

TEACHER SAY: **Good work today with fractions of a set. Thank you for sharing your math thinking. We learn so much from each other every day. In our next math class, we will work with fractions of sets again. Give your Shoulder Partner a high five.**

 STUDENTS DO: Give **Shoulder Partner** a high five.

Lesson 108 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Identify fractions of a set of objects. • Write fraction questions about a set of objects.	• Review vocabulary as needed.	• Calendar Math area • Bag with objects representing ¾ • Student Mathematics Book and pencil

LESSON PREPARATION FOR THE TEACHER

Place a set of objects in a brown (or other opaque) bag that represents ¾. For example, 3 red blocks and 1 blue block or 3 apples and 1 banana.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students continue to explore fractions of a set, identifying a given fraction from a set. If time allows, students extend their learning by creating sets and asking partners to identify a fraction of the set. Remember that the Mathematics Student Book can serve as a valuable source of information about students' understanding of fractions.

This lesson references the objects in the bag as 3 apples and 1 banana. Substitute the language for the objects you used.

1. TEACHER DO: Have available a bag of objects representing ¾. On the board, draw a rectangle that is divided into four equal parts but do not color in any of the parts.

TEACHER SAY: On the board, I have drawn a rectangle that is divided into four equal parts, or fourths. Give me a Thumbs Up if you can come to the front and shade in this rectangle so that it shows ¾.

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected student shades in ¾.

TEACHER SAY: Nice job. This rectangle is divided into four parts, and _____ (student's name) colored in three of the four, so ¾ of the rectangle is colored. There are four objects in this bag. Let's look at them together.

TEACHER DO: Take out the four objects and show them to the students.

TEACHER SAY: I have four pieces of fruit in this set. Lean and Whisper what fraction of this set is apples.

 **STUDENTS DO: Lean and Whisper**: ¾.

TEACHER SAY: Yes, ¾ of this set are apples. The rectangle on the board shows ¾ of a whole. The apples are ¾ of a set. Now I am going to use Calling Sticks to choose three students. Come to the front when called.

 **STUDENTS DO:** Selected students stand in front of the class.

TEACHER SAY: Look closely at this set of students. Turn and Talk to your Shoulder Partner and see if you can find something that ⅔ of this set have in common. Give me a Thumbs Up when you are ready to share.

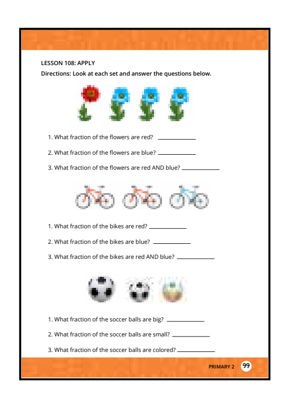
 **STUDENTS DO: Turn and Talk** to their **Shoulder Partner** about something that ⅔ of the set of students have in common. Give a **Thumbs Up** when ready to share. Selected students share their thinking.

TEACHER DO: Call on a student to share and then call on a different student who has a different idea. There may be many things that ⅔ of the group have in common.

TEACHER SAY: Nice job. Those are all examples of things that ⅔ of the set of students have in common. If ⅔ of the set have _____ (one of the student's answers) in common, what fraction does not have _____ in common? Raise your hand to share.

 **STUDENTS DO:** Raise hand to share. Selected student shares: ⅓.

TEACHER SAY: Yes, ⅔ are _____ and ⅓ is not _____. Today you are going to practice identifying fractions of a set again. Take out your Mathematics Student Book and open it to page Lesson 108: Apply.



LESSON 108: APPLY

Directions: Look at each set and answer the questions below.

1. What fraction of the flowers are red? _____
2. What fraction of the flowers are blue? _____
3. What fraction of the flowers are red AND blue? _____

1. What fraction of the bikes are red? _____
2. What fraction of the bikes are blue? _____
3. What fraction of the bikes are red AND blue? _____

1. What fraction of the soccer balls are big? _____
2. What fraction of the soccer balls are small? _____
3. What fraction of the soccer balls are colored? _____

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 **STUDENTS DO:** Take out Mathematics Student Book and turn to page Lesson 108: Apply.

TEACHER SAY: On this page, there are pictures of sets of objects. For each problem, you are

asked to identify a fraction of the set and then answer questions about the set. Let's take a look at the first one together.

TEACHER DO: Read the directions and the questions below the first problem.

TEACHER SAY: **Work with your Shoulder Partner and do this first one together. Give me a Thumbs Up when finished.**


STUDENTS DO: Work with their **Shoulder Partner** to complete the first problem. Give a Thumbs up when ready to share. Selected students share answer.

TEACHER DO: Call on three students to share their thinking (one student for each question). Write the fraction on the board to model how to write fractions.

TEACHER SAY: **Nice work. $\frac{1}{4}$ of the flowers are red. $\frac{3}{4}$ of the flowers are blue, and $\frac{4}{4}$ of the flowers are red and blue. Remember that $\frac{4}{4}$ is the whole group. Now you will work with your Shoulder Partner to solve the rest of the problems in your book. If you finish all of them, come and see me.**


STUDENTS DO: Work with **Shoulder Partner** to answer questions about fractions of a set. Students who finish early do the extension activity listed in the Note to the Teacher below.

Note to the Teacher: As an extension activity, have students who finish early write another question that can be answered by the one of the pictures, such as What fraction of the flowers have leaves?

TEACHER DO: Walk around the class and observe students working together to answer questions about the sets. Support students as needed and note who is having trouble. Explain extension activity to those students who finish early. When time is up, Use an **Attention Getting Signal**.

TEACHER SAY: **I saw you doing a lot of hard work today. Keep out your student book for Reflect.**

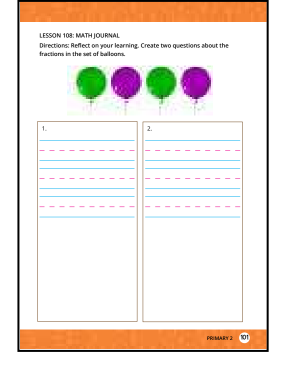


Reflect (5 minutes)



Directions

Note to the Teacher: Today students continued to explore fractions of a set and answer questions about sets. For Reflect, they examine an image and write two questions that can be answered about the set using fractions. Collect the Mathematics Student Books at the end to check understanding.



1. TEACHER SAY: **Turn to page Lesson 108: Math Journal in your student book.**


STUDENTS DO: Turn to page Lesson 108: Math Journal.

TEACHER SAY: **Today you answered questions about a set of objects. Some of you even wrote your own fraction questions that could also be answered about the set. In your book, there is an image of a set of objects. Look closely at the image and then write two fraction questions that could be answered about this set. Record your questions in your book.**


STUDENTS DO: Examine the image in their book and then write two fraction questions that could be answered about the set.

TEACHER SAY: **Good work today. You are getting very good at identifying fractions. Your questions are wonderful. Give yourself a pat on the back and put away your materials.**


STUDENTS DO: Pat themselves on the back and put away materials.

Lesson 109 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Solve story problems involving fractions of a whole or a set. • Evaluate their progress in learning about fractions.	• Review vocabulary as needed.	• Calendar Math area • Sets of Fraction Story Problem Cards (one set per small group of students) • Student Mathematics Book and pencil

LESSON PREPARATION FOR THE TEACHER

Print and cut sets of Fraction Story Problem Cards (one set per small group of students).



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

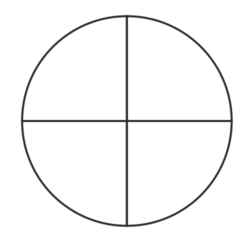
Note to the Teacher: In this lesson, students solve story problems about fractions. The problems include fractions of a whole and fractions of a set. Students share a set of Fraction Story Problem Cards, but work independently. The group format offers built-in reading support as well as support solving the problems if needed. The format should feel familiar to students, with the only new element being fraction content.

Also, there are two cards in the set—Cards I and J—that involve sixths, which is not a standard for Primary 2. However, you may have some students who are ready for that challenge. Decide whether or not you will include those cards in the sets you give students. Additionally, you can create alternate card sets to meet the needs of your current students.

1. TEACHER DO: Write the following on the board: Marwa baked an apple pie and cut it into four equal pieces. She gave one piece to her brother and one piece to her sister.

TEACHER SAY: We have worked on fractions for eight days. We looked at fractions of shapes and of sets. Today we are going to solve some story problems. We have done story problems before, but today the stories will involve fractions. Let's look at the story problem on the board.

TEACHER DO: Read the story problem aloud. Then draw a picture of the pie cut into four pieces.



TEACHER SAY: I have drawn a picture of this pie to help me understand what is happening in the story problem. Drawing pictures can help us understand what is happening and solve story problems. Also, this story reminds me of when we folded our circles (pies) into equal parts on our first day of fractions.

What question does this story problem ask us?

 **STUDENTS DO:** Selected students share their thinking: The story does not ask a question.

TEACHER SAY: Right, this story problem does not ask us a question. We know that Marwa baked a pie that she cut in fourths. Looking at the picture and hearing the story, could I answer the question, What fraction of the pie did Marwa's brother eat? Pop up if you think you could answer that question.

 **STUDENTS DO:** Pop up if able to answer question. Selected student answers the question.

TEACHER SAY: Yes, we can answer that question. Marwa's brother ate ¼ of the pie. Is there another question we could ask and answer about this pie? Turn and Talk to your Shoulder Partner about another question that could be asked and answered. Give me a Thumbs Up to share your question.

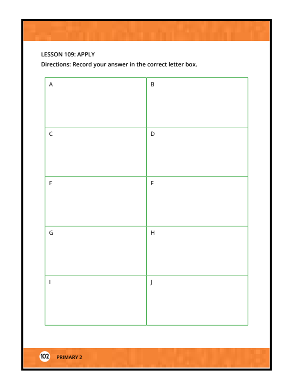
 **STUDENTS DO:** **Turn and Talk** to **Shoulder Partner** about a question that can be answered about the pie. Give a **Thumbs Up** to share. Selected students share questions and answers.

TEACHER DO: If no one asks how much of the pie is left, guide the students or offer that as a question and have students share the answer. The idea is to get students to think about all the fractions that this word problem could contain, so that when they see a variety of questions on the Fraction Story Problem Cards, they will have had exposure to them.

2. TEACHER SAY: Nice job. There are many questions we can ask about this story. Today you are going to work on solving some story problems on your own. There will be a question for

you to answer based on the story, but it is good to first have a clear understanding of the story or problem and what might be asked. You can draw a picture to help you solve the story problem, just like we did on the board.**

You will work in a group. Each group will get a set of Fraction Story Problem Cards. Try to solve the story problems on the cards independently, but the group is there to support you if needed. Also, after you solve a problem, you can check your answers with a partner who solved the same problem.



LESSON 109: APPLY

Directions: Record your answer in the correct letter box.

A	B
C	D
E	F
G	H
I	J

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Take out your Mathematics Student Book and turn to page Lesson 109: Apply.

 STUDENTS DO: Take out Mathematics Student Book and turn to page Lesson 109: Apply.

TEACHER SAY: **Each card has a letter. Once you solve a problem, write the answer in the box with the matching letter. Cards I and J are challenging. If you pick card I or J and it is too difficult, put the card back and choose another one.**

I will use Calling Sticks to create groups. One member of the group can come and get a set of Fraction Story Problem Cards. Find a place to sit together and start solving. Take your student book with you.

TEACHER DO: Use **Calling Sticks** to create groups of four or five, depending on class numbers. Hand out a set of Fraction Story Problem Cards to each group.

 STUDENTS DO: Take Mathematics Student Book and find group. Work for the rest of the Learn time to solve the problems on the cards. Record answers in book. Check answers with others in the group.

TEACHER DO: Walk around and observe students as they solve the problems. Offer help as needed. Suggest students draw pictures if they are having difficulty understanding the story problem. When time is over, use an **Attention Getting Signal**.

Note to the Teacher: As an extension activity, have students who finish early write their own fraction story problem for others in the group to solve.

TEACHER SAY: **Wonderful work today. Return your card sets to me and return to your seat for Reflect. Keep out your student book.**

 STUDENTS DO: Return card sets to the teacher and return to seat.



Reflect (5 minutes)

Directions

Note to the Teacher: Today students solved fraction story problems. For Reflect, student evaluate their own learning related to fractions of a whole and of a set. They identify current strengths and weaknesses and rate their personal progress.

1. TEACHER SAY: **Turn to page Lesson 109: Math Journal in your student book.**

 STUDENTS DO: Turn to page Lesson 109: Math Journal.

TEACHER SAY: **We have been working on fractions now for nine days. We started by looking at fractions of a whole, such as a circle or rectangle, and then looked at fractions of a set. We have learned so much about fractions that today we were able to solve some fraction story problems.**

For Reflect, you are going to think about all of the work you have done and how much you have learned about fractions. Your reflection will be private. You will not be sharing it with a partner.

In your book, there is a line with numbers 0 to 5. Think about your own understanding of fractions. Do you understand what a fraction is and how to identify one? Can you solve a problem where there is a set of things and you have to identify the fraction? Can you solve a story problem involving fractions? Reflect on your learning for a moment. What have you learned? What are you still working on?

 STUDENTS DO: Think quietly about learning related to fractions.

TEACHER SAY: **Circle a number on the line that shows how you are feeling about your understanding. A 5 means that you feel very confident and would answer yes to all of those questions. A 1 or a 2 means that you are feeling like fractions are still kind of tricky and you need more practice. A 3 is right in the middle, meaning you think fractions are not easy, but you understand some of it. Circle a number now.**

 STUDENTS DO: Think for a minute and then circle a number to indicate their current level of understanding of fractions.

TEACHER SAY: **Now write about why you chose the number you did. Remember, your reflection is private and will not be shared with a partner.**

 STUDENTS DO: Write a rationale for their personal rating.

TEACHER DO: Be sure to review students' Math Journal entries at a later time to see how they are currently feeling about fractions.

TEACHER SAY: **Give your Shoulder Partner a high five and put away your materials.**

 STUDENTS DO: Give **Shoulder Partner** a high five and put away materials.

Lesson 110 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Partition rectangles into three or four equal parts. • Demonstrate understanding that each fractional part of a rectangle is part of a whole. • Describe equal parts of a whole using fraction vocabulary.	• Review vocabulary as needed.	• Calendar Math area • Sample of a completed fraction flag • Large sheet of white card stock or construction paper (one sheet per student) • Image of the Egyptian flag • Fraction Flag Label (one per student) • Construction paper (small sheets) • Rulers • Scissors • Glue or glue sticks • Other decorative materials such as glitter, sequins, pom poms, or chenille stems (optional)

LESSON PREPARATION FOR THE TEACHER

Make a sample fraction flag divided into fourths to show students.

Have available an Egyptian flag to show as an additional example.

Print out Fraction Flag Labels (one label per student). See the Fraction Flag Label Blackline Master.

Gather materials for students to use to decorate their fraction flags. For example, markers, crayons, rulers, scissors, glue, glitter, sequins, pom poms, chenille stems, and so on.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

3. TEACHER SAY: Let's play a fact game.

TEACHER DO: Repeat the same procedure as Lesson 101 (or play a new game).



STUDENTS DO: Play the fact game selected by the teacher.

Learn (40 minutes)

Directions

Note to the Teacher: In this lesson, students design and make a fraction flag as a culminating project. Students can choose thirds, fourths, or another fractional part. Discourage halves as a choice unless that is appropriate for individual students. Allowing students to choose their fraction quantity for this activity is a form of differentiation. However, if necessary, you may dictate specifications for individuals who need additional support or challenge.

1. **TEACHER DO:** Post your completed fraction flag and the Egyptian flag.

TEACHER SAY: As a culmination of all of our work on fractions, we are going to make fraction flags. On the board, I have an example that I made as well as our own Egyptian flag. Turn to your Shoulder Partner and talk about both flags. What fraction is the Egyptian flag divided into? What fraction is my flag divided into? I will use Calling Sticks to hear some of your observations.

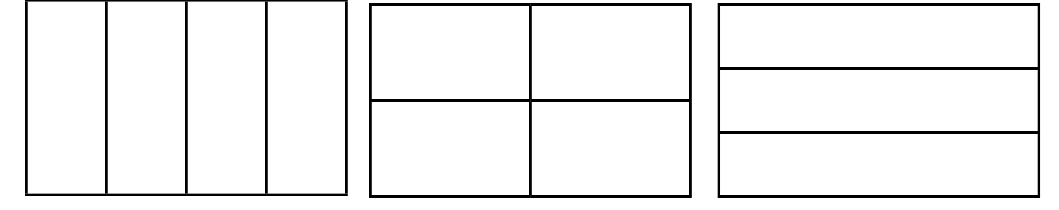
 **STUDENTS DO:** Turn to **Shoulder Partner** and discuss both flags. Selected students share what they notice.

TEACHER SAY: Yes, the Egyptian flag is divided into thirds. ⅓ is red, ⅓ is white, and ⅓ is black. It is a great example of thirds. In the middle is a symbol. If you have time and would like to design a symbol for your flag, you can do that too. My flag is divided into fourths. I have ¼ _____ (color/pattern), ¼ _____ (color/pattern), ¼ _____ (color/pattern), and ¼ _____ (color/pattern). I also made a symbol for the center of my flag and a label that explains my flag.

TEACHER DO: Display Fraction Flag Label with your flag. Read it aloud to students.

TEACHER SAY: For math today, you will get a large piece of paper for your flag. Decide how many fractional parts you want your flag to have. We know that to represent fractions, the parts have to be equal, so each part of your flag must be the same size. There may be more than one way to do that. For example, remember when we folded paper? As long as you have equal parts that is fine.

TEACHER DO: If needed, draw on the board ways to divide the paper into thirds or fourths or have students suggest and model. Examples are shown below.



TEACHER SAY: Once you have divided your paper into thirds or fourths, color in each section using crayons or markers and use the other materials to decorate each section of your flag. You can make each section the same, some of the sections the same, or all of them different. It is up to you. Also, if you feel ready for a challenge and want to divide your flag into more difficult fractions, like sixths or eighths, you may do so. Please let me check your flag before you decorate.

Once you are done with your flag, get a label (or make own). On your label, describe your flag and each fractional section as well as what kind of flag you have made—a flag of fourths or thirds, and so on. Raise your hand if you have any questions.

 **STUDENTS DO:** Raise hand to ask clarifying questions if needed.

TEACHER DO: Make sure all students understand the directions. Hand out materials to students. Students sitting at the same table may share decorating materials.

STUDENTS DO: Work on their flag for the remainder of Learn time. When done, create a Fraction Flag Label describing their flag.

TEACHER DO: Walk around to observe students as they make flags. Offer support as needed, particularly to students who are struggling or students who are making flags divided into sixths or eighths. Help students with their labels if necessary. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Great work today. Your flags are beautiful. Clean up your supplies. Then display your flag on your desk.**

 **STUDENTS DO:** Clean up supplies and put flag on desk.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students do a **Gallery Walk** *to share their final products and observe the many different ways their friends created their flags.*

1. **TEACHER SAY:** **Today we are going to do a Gallery Walk to look at each other's fraction flags. You will walk around the room looking at each other's flags. Did they make a flag that had the same fraction as you? If so, did you show the fraction in the same way? Read your friends' Fraction Flag Labels to learn more about their flags. Do not touch your friends' flags. Walk around quietly for 2 minutes. When I clap three times, stop and return to your seat. Then we will share.**

 **STUDENTS DO:** Walk around class looking at other students' work. Return to seat when the teacher claps.

TEACHER SAY: **Give me a Thumbs Up if you would like to share with the group what you noticed.**

 **STUDENTS DO:** Give a **Thumbs Up** to share. Selected students share what they notice.

TEACHER DO: Call on three or four students to share their observations.

TEACHER SAY: **Great work today making fraction flags. I will collect the flags so I can display them. Give yourself a hug for doing such great work.**

 **STUDENTS DO:** Hug themselves.

PRIMARY 2

Mathematics

COMMUNICATION

Chapter 6

Lessons 111 to 120

Lessons 111 to 120

COMPONENT	DESCRIPTION	LESSONS
Calendar Math	During this daily routine, students develop number sense, calendar sense, early place value concepts, counting fluency, and problem-solving skills.	15 to 20 minutes
Learn	During this daily routine, students learn and apply various math skills as the teacher guides them through review, instruction, and practice.	35 to 40 minutes
Reflect	During this daily routine, students develop their ability to express mathematical ideas by talking about their discoveries, using math vocabulary, asking questions to make sense of learning tasks, clarifying misconceptions, and learning to see things from students' perspectives.	5 to 10 minutes

Learning Indicators

Throughout Lessons 111 to 120, students will work toward the following learning indicators:

B. OPERATIONS AND ALGEBRAIC THINKING:

1.b. Fluently add and subtract within 20 using mental strategies.
1.c. Use addition and subtraction within 100 to solve one- and two-step story problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.
1.d. Solve addition and subtraction problems within 100 with one unknown in any position within the equation.
2.b. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns.
2.c. Write an equation to express the total number of objects in an array as a sum of equal addends.

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.b. Fluently add and subtract two 2-digit numbers with or without regrouping.
2.d. Add 1-, 2-, and 3-digit numbers to 3-digit numbers using a variety of strategies including regrouping.
2.e. Explain why it is sometimes necessary to regroup tens or hundreds to solve problems.

D. MEASUREMENT AND DATA:

4.a. Organize data with up to four categories into scaled bar and pictographs (scales limited to 2, 5, 10).
4.b. Solve simple put-together, take-apart, and compare problems using data presented in a bar graph or pictograph.

Computational Thinking

B. OPERATIONS AND ALGEBRAIC THINKING:

1.b. Fluently add and subtract within 20 using mental strategies.
1.c. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.
1.d. Solve addition and subtraction problems within 100 with one unknown in any position within the equation.

C. NUMBERS AND OPERATIONS IN BASE TEN:

2.a. Apply a variety of problem-solving strategies based on concrete models or drawings, place value concepts, properties of operations, and/or the relationship between addition and subtraction and relate the strategy to a written method.
2.b. Fluently add and subtract two 2-digit numbers with or without regrouping.
2.d. Add and subtract 1-, 2- and 3-digit numbers from 3-digit numbers using a variety of strategies including regrouping.

CH 6 Pacing Guide

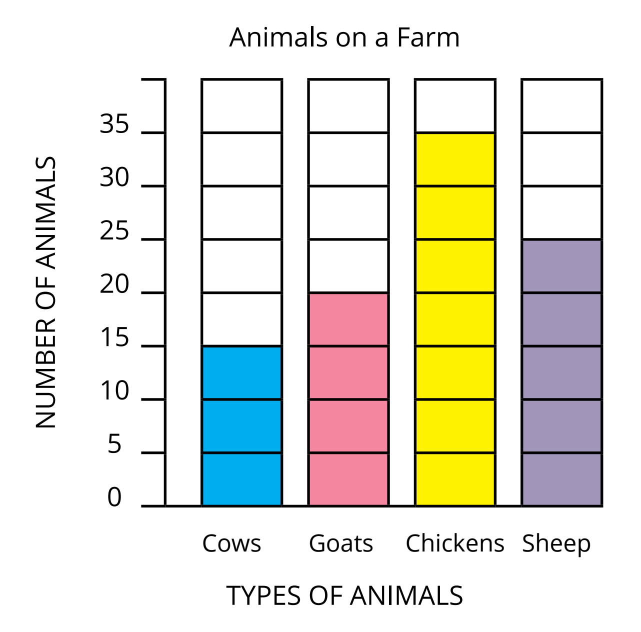
LESSON	INSTRUCTIONAL FOCUS
111	Students will: • Participate in Calendar Math activities. • Interpret data in bar graphs with a scale of 5 or 10. • Interpret data in pictographs with a scale of 2 or 5. • Explain why it is important to use an appropriate scale when creating graphs.
112	Students will: • Participate in Calendar Math activities. • Organize four categories of data into a bar graph. • Choose an appropriate scale based on the data being graphed. • Create and solve put-together, compare, and take-apart problems using data.
113	Students will: • Participate in Calendar Math activities. • Organize four categories of data into a pictograph. • Choose an appropriate scale based on the data being graphed. • Create and solve put-together, compare, and take-apart problems using data.
114	Students will: • Participate in Calendar Math activities. • Identify real-world arrays. • Write repeated addition sentences for arrays. • Calculate the total number of objects in arrays.
115	Students will: • Participate in Calendar Math activities. • Create arrays with given rows and columns. • Write a repeated addition sentence to express the total number of objects in an array.
116	Students will: • Participate in Calendar Math activities. • Add and subtract 1-, 2-, and 3-digit numbers. • Apply a variety of strategies to solve problems. • Identify and correct errors in their work and the work of others.
117	Students will: • Participate in Calendar Math activities. • Add and subtract 2- and 3-digit numbers. • Write story problems for addition and subtraction equations. • Apply a variety of strategies to solve addition and subtraction story problems.
118	Students will: • Participate in Calendar Math activities. • Add and subtract 2- and 3-digit numbers. • Collaborate to play a math game. • Evaluate their progress in adding and subtracting with regrouping.

LESSON	INSTRUCTIONAL FOCUS
119	Students will: • Participate in Calendar Math activities. • Reflect on their learning in Primary 2 Mathematics. • Describe major skills and concepts learned in Primary 2.
120	Students will: • Participate in Calendar Math activities. • Reflect on their learning in Primary 2 Mathematics. • Describe major skills and concepts learned in Primary 2. • Write a letter describing major skills and concepts learned in Primary 2.

Chapter Preparation for Teacher

For Lesson 111:

- Make a large version of the bar graph shown below.



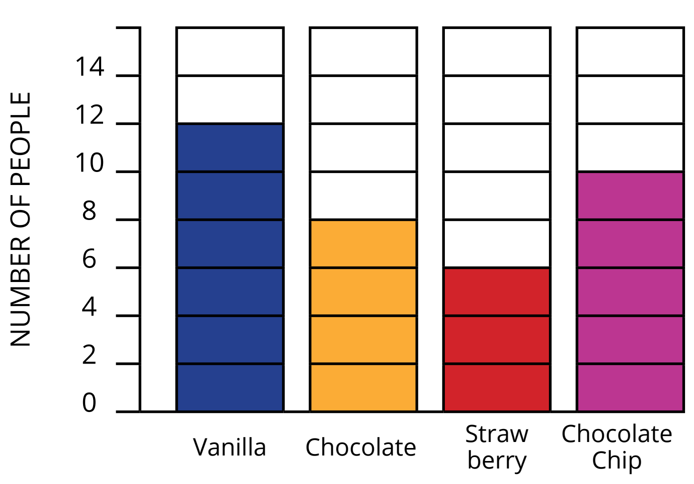
- Make a large version of the pictograph shown below.

Animals on a Farm Key = Each animal picture represents 5 animals							
Cows							
Goats							
Chickens							
Sheep							

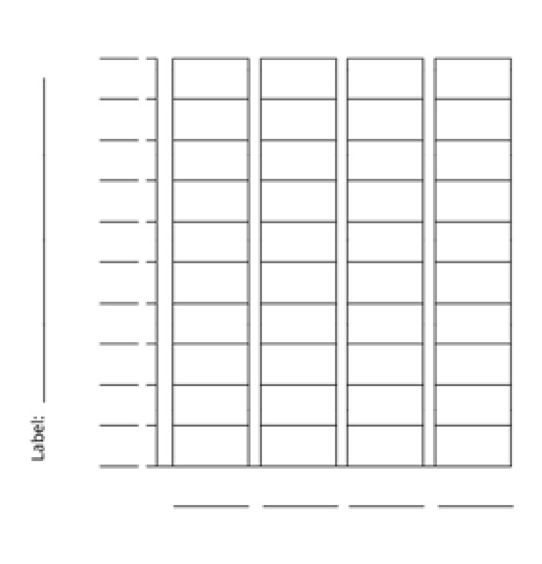
For Lesson 112:

- Make a large version of the Favorite Ice Cream Flavor bar graph shown below.





- Make a large version of the blank bar graph shown below.



For Lesson 113:

- Make a large version of the blank pictograph shown below.

Title: ______________________

Winged Cows							
Miniature Goats							
Golden Sheep							
Rainbow Fish							

KEY

For Lesson 114:

- Print Array Images Blackline Master.
- For Reflect, students will look for examples of arrays in the classroom. If necessary, create arrays or place images of arrays around the room prior to the lesson to facilitate this exercise.

For Lesson 115:

- Gather dice for students to use to create arrays. Each pair of students will need two dice.

For Lessons 116 and 117:

- Have available the place value materials from Lesson 84.
- Print sets of Hundreds–Tens–Ones Charts (one per student). See the HTO Charts Blackline Master.

For Lesson 118:

- Create sets of Regrouping Game Cards (one set per small group of students). See the Regrouping Game Cards Blackline Master.
- Gather playing pieces for students to use as they play the game. Each student in a group will need a unique token (for example, painted stones, plastic game pieces, or broken pieces of crayon).
- Gather dice (one die per small group of students).
- Have available the place value materials from Lesson 84 and copies of the HTO chart.
- Create a poster listing the game rules below.

  Game Rules:

  1. Both teams put playing pieces on the oval labeled START.
  2. Team 1 rolls the die. If the roll is even, move 2 spaces. If the number is odd, move 3 spaces.
  3. Team 1 picks a card from the deck and solves the problem or follows the direction.
  4. Team 2 checks the answer.
  5. If Team 1 is correct, they stay on the spot.
  6. If Team 1 is incorrect, they move back 1 space.
  7. Then Team 2 takes their turn.
  8. Play continues until one team reaches the FINISH pentagon.

For Lesson 119:

- Create the large chart shown below for review of the five major areas of mathematics (the "Big 5") covered in Primary 2: Operations and Algebraic Thinking, Numbers and Operations in Base Ten, Measurement, Data, and Geometry.

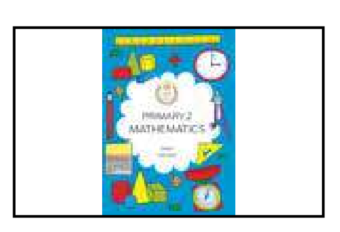
The Big 5 of Primary 2	
Operations and Algebraic Thinking	
Numbers and Operations in Base Ten	
Measurement	
Data	
Geometry	

Materials Used

Calendar math area



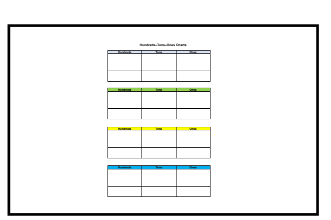
Student book



Pencils



HTO charts



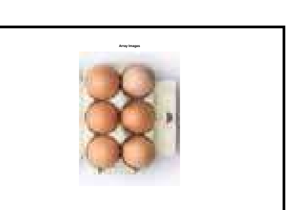
Dice



Crayons



Array images



Blank bar graph

Large version of Favorite Ice Cream Flavor bar graph

Place value mat

Playing pieces

Big 5 chart

Lesson 111 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Interpret data in bar graphs with a scale of 5 or 10.
- Interpret data in pictographs with a scale of 2 or 5.
- Explain why it is important to use an appropriate scale when creating graphs.

LESSON PREPARATION FOR THE TEACHER

Make a large version of the Animals on a Farm bar graph and pictograph. See Chapter Preparation for the Teacher for details.

KEY VOCABULARY

- Axes
- Bar graph
- Data
- Horizontal
- Key
- Pictograph
- Scale
- Vertical

MATERIALS

- Calendar Math area
- Large version of the Animals on a Farm bar graph
- Large version of the Animals on a Farm pictograph
- Mathematics Student Book and pencil



Calendar Math (15 minutes)

Directions

Note to the Teacher: Over the next 10 lessons, select previously learned math content to review with students. Identify topics based on students' performance in class, assessment data, and their Math Journal entries. Suggestions are listed below. Remember that this additional component of Calendar should just take a few minutes. It is intended as a quick review for students.

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: For the next 10 days of math class, we will review a variety of topics from our whole year of math lessons. Today let's review _____ (topic).

TEACHER DO: Choose from one of the following activities to do a quick few minutes of practice with the class.

- Fact families
  - Play a game from Lessons 101 to110.

- Time
  - Identify the time shown on an analog clock.
  - Draw hands on an analog clock to show a given time.

- Skip count
  - Count around the room by 2s, 5s, 10s.

- Number patterns
  - Continue a number pattern that is started.

- Money
  - Identify pounds needed to buy a posted object.
  - Count pounds.
  - Solve a money story problem.

- Data
  - Analyze data shown on bar graphs and pictographs.

- Problem-solving/regrouping
  - Solve story problems involving addition or subtraction with regrouping.

- Place value
  - Expand numbers.
  - Mentally add and subtract 10 or 100 from a given number.

- Fractions
  - Identify a fraction.
  - Color a picture to show a given fraction.
  - Solve a fraction story problem.

- Arrays
  - Describe, build, or draw a stated array.

 **STUDENTS DO:** Participate in the review activity.



Learn (40 minutes)

Directions

Note to the Teacher: In the next three lessons, students review data. They analyze the same data represented in a bar graph and a pictograph. They discuss scales and how scales impact the representation of data in graphs. Students interpret a bar that is halfway between two quantities and a pictograph with half of a picture. Finally, they create their own graph.

Analyzing and interpreting data are core competencies of computational thinking. After collecting data, it must be organized and presented in a format that allows for analysis. Students learn to analyze and investigate patterns and relationships and communicate their findings. The next several lessons provide multiple and varied opportunities for students to build competence and confidence in presenting, sharing, and interpreting data.

1. TEACHER DO: Display the Animals on a Farm bar graph and pictograph.

TEACHER SAY: On the board are two different types of graphs. Turn to your Shoulder Partner and talk about what you know about these graphs. What are they called? How are they the same and how are they different? How are they organized? In a minute, I will use Calling Sticks to hear what you discussed.

 **STUDENTS DO:** Talk to **Shoulder Partner** about the graphs on the board.

TEACHER DO: Wait 1 minute for partners to discuss the graphs and then use **Calling Sticks** to choose three or four students to share what they discussed.

STUDENTS DO: Talk to **Shoulder Partner** about the graphs on the board. Selected students share their thinking about the graphs.

TEACHER DO: Record students' observations.

TEACHER SAY: You shared many great observations. Both of these graphs represent data about animals on a farm. The first one uses bars and is called a bar graph. The second uses pictures and is called a pictograph. Let's look a little more closely at the bar graph. Remember that graphs give us information to understand and interpret, or make sense of. Turn to your Shoulder Partner and see if you can determine from the bar graph how many goats are on the farm. Give me a Thumbs Up when ready to share and explain how you found that information.

STUDENTS DO: Talk to their **Shoulder Partner** about the bar graph data for goats. Give a **Thumbs Up** when they are ready to share. Selected students share their thinking and explanations.

TEACHER SAY: Yes, there are 20 goats on the farm according to this bar graph. Remember, in a bar graph there are two axes, or two lines—a horizontal one and a vertical one. The vertical axis is labeled "Number of Animals." It is numbered 5, 10, 15, 20, and so on. Raise your hand if you know what the bar graph is counting by.



STUDENTS DO: Raise hand to volunteer. Selected students share their answers.

TEACHER SAY: Yes, it is counting by 5s. The SCALE is 5. The horizontal axis is labeled "Types of Animals." The bar for goats goes up to the line for 20. That means that there are 20 goats.

TEACHER DO: **Model** on the graph how to find the bar for goats and then move to the vertical axis and find the number 20.

TEACHER SAY: How many chickens are on this farm? Lean and Whisper.



STUDENTS DO: Lean and Whisper: 35.

TEACHER SAY: Yes, there are 35 chickens on the farm. We can tell that by looking at the bar for chickens and then going to the vertical axis to see the number the bar represents. Why do you think that the person who made this graph did not number the vertical axis 1, 2, 3, 4 but chose to count by 5s? Turn to your Shoulder Partner and discuss.



STUDENTS DO: Share ideas with a **Shoulder Partner**.

TEACHER DO: Wait 1 minute for partners to discuss and then use **Calling Sticks** to choose two or three students to share what they discussed.



STUDENTS DO: Selected students share their thinking.

TEACHER SAY: When you have a lot of data, you need to decide the best way to show it. On this graph there are a lot of animals, so the person who made the graph had to think of the best way to show those large numbers. They chose a scale of 5. Is there another scale that could have been used to show the large numbers of animals? Lean and Whisper.



STUDENTS DO: Lean and Whisper: 10 or 2 (other answers possible).

TEACHER SAY: I heard a lot of choices. It is usually best to pick a number that is easy to count by like 2, 5, or 10. If this graph had a scale of 10, how would we show 35 chickens? Raise your hand if you have an idea.



STUDENTS DO: Students raise hand. Selected students share their thinking.

TEACHER DO: Confirm accurate ideas. Correct students' major misconceptions. If no one mentions it, explain that the bar would be halfway between 30 and 40.

TEACHER SAY: If the bar graph had a scale of 10, the bar for 35 chickens would be halfway between 30 and 40 because 35 is halfway between 30 and 40. Reading graphs is like detective work. You must be sure you look closely and know the scale.

TEACHER DO: Point to the scale on the bar graph.

2. TEACHER SAY: Now let's look at the pictograph. It shows the same data in a different way. Let's look at the chickens again. The bar graph says there are 35 chickens on the farm. How do we know that the pictograph shows 35 chickens? How can I tell that on this graph? Give me a Thumbs Up to share your thinking.

 **STUDENTS DO:** Think about the teacher's question. Give a **Thumbs Up** when ready to share. Selected students share their thinking.

TEACHER DO: Confirm accurate observations. Correct students' major misconceptions.

TEACHER SAY: In a pictograph, each picture represents a number. The pictograph will have a key to tell you what each picture represents. The key for this pictograph tells us that each animal picture represents 5 animals. There are 7 chicken pictures. Hold up 7 fingers and count each finger by 5s. Count with me.

 **STUDENTS DO:** Hold up 7 fingers and skip count by 5s to 35 with the teacher.

TEACHER SAY: Good job. There are 35 chickens represented on the pictograph. Look at the pictograph and tell me how many cows are on this farm. Lean and Whisper.

 **STUDENTS DO: Lean and Whisper**: 15.

TEACHER DO: Repeat the skip counting activity with students to count the cows.

 **STUDENTS DO:** Hold up 3 fingers and skip count by 5s to 15.

TEACHER SAY: Good. I can also look at the bar graph and see that the bar goes up to 15. Both graphs tell me that there are 15 cows on this farm. Both graphs use a scale of 5, not 1. If the pictograph had a scale of 10, how would we show 15? Think for a minute and then give me a Thumbs Up to share ideas.

 **STUDENTS DO:** Think about the teacher's question. Give a **Thumbs Up** when they are ready to share. Selected students share their thinking.

TEACHER SAY: Good. In a pictograph, if there is half of an image, it means that it represents half of the scale number. If the scale is 10, half of a picture would be 5. We could draw 1½ cows to mean 10 cows and 5 cows, or 15 cows on the farm. If you see half of an image on a pictograph, you must look closely at the scale and think about what the half picture represents.

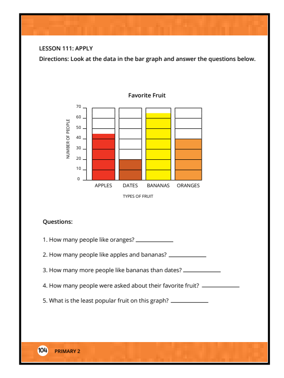
TEACHER DO: Model on the board how the cows would look if the scale was 10.

3. TEACHER SAY: The bar graph and the pictograph show the same data but in different forms. We looked at how many goats, chickens, and cows there were, but we could ask many different questions about these graphs. Turn to your Shoulder Partner and talk about some questions that could be asked and answered from these graphs. Give me a Thumbs Up when you have some questions to share.

 **STUDENTS DO:** Turn to **Shoulder Partner** and discuss questions that could be asked about the graphs. Give a **Thumbs Up** when ready. Selected students share questions.

TEACHER DO: Record students' questions on the board. Look for questions such as the following, and if not mentioned, add them to the list:

- How many total animals are on the farm?
- How many more chickens are there than pigs/goats/cows?
- How many chickens and goats are there?
- Which animal appears the least/most?


LESSON 111: APPLY

Directions: Look at the data in the bar graph and answer the questions below.

Questions:

1. How many people like oranges? ___________
2. How many people like apples and bananas? ___________
3. How many more people like bananas than dates? ___________
4. How many people were asked about their favorite fruit? ___________
5. What is the least popular fruit on this graph? ___________

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TEACHER SAY: Good job. All of these questions could be answered using these graphs. Now it is your turn to analyze some other graphs and answer some questions about the data. Take out your Mathematics Student Book and turn to page Lesson 111: Apply.

 **STUDENTS DO:** Take out Mathematics Student Book and turn to page Lesson 111: Apply.

TEACHER SAY: On this page, there is a bar graph and a pictograph. Look at each graph and answer the questions about the data shown in the graphs. Be sure to look at the scale before answering questions.

 **STUDENTS DO:** Spend the rest of Learn time answering questions about the bar graph and pictograph in their student book.

Note to the Teacher: As an extension activity, have students who finish early write other questions that can be asked about the data in the graphs.

TEACHER DO: Walk around and observe students working. Note which students are having difficulty interpreting the graphs. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: Good work today. Put away your student book and pencil.

 **STUDENTS DO:** Put away book and pencil.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students interpreted bar graphs and pictographs. They considered different scales and why scales may change depending on the data. For Reflect, they expand this concept by discussing why using a small scale for a large set of data is not ideal.

1. TEACHER SAY: Today we reviewed bar graphs and pictographs and answered some questions about them in our Mathematics Student Book. Let's look at the farm graphs again now. Both graphs had a scale of 5 and we discussed how we could use a scale of 10. What would the graphs look like if we used a scale of 2 to represent the same data? Turn to your Shoulder Partner and share your thinking. Does a scale of 2 make sense for this data? Why or why not? I will give you 2 minutes to talk.

 **STUDENTS DO:** Talk to **Shoulder Partner** about the prompt.

TEACHER DO: After 2 minutes, use **Calling Sticks** to choose three or four students to share thinking.

 **STUDENTS DO:** Selected students share their thinking.

TEACHER DO: Confirm accurate ideas. Correct students' major misconceptions. If no students mention the need for a much larger graph if the scale were 2, ask questions to facilitate their thinking.

TEACHER SAY: Good work today. In our next math class, you will get to make some bar graphs of your own, so understanding what scale to use will be helpful.

Lesson 112 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Organize four categories of data into a bar graph. • Choose an appropriate scale based on the data being graphed. • Create and solve put-together, compare, and take-apart problems using data.	• Review vocabulary as needed.	• Calendar Math area • Large version of Favorite Ice Cream Flavor bar graph • Large blank bar graph • Story: The Magical Animals of Zioploris, Part 1 • Crayons or colored pencils • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a large version of the Favorite Ice Cream Flavor bar graph and the blank bar graph. See Chapter Preparation for the Teacher for details.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, the class interprets a graph with a scale of 2. Students listen to a story and use data from the story to create a bar graph. They also ask and answer questions about the data in the graph.

1. TEACHER DO: Display the large Favorite Ice Cream Flavor and blank bar graphs you created.

TEACHER SAY: In our last math class, we looked at both bar graphs and pictographs. Today we are going to focus on bar graphs. On the board is a bar graph about favorite flavors of ice cream. Look at the graph and Lean and Whisper what the scale is for this data.



STUDENTS DO: Lean and Whisper: 2.

TEACHER SAY: Yes, this bar graph has a scale of 2. What was the scale of the bar graph we worked with yesterday?



STUDENTS DO: Call out: 5.

TEACHER SAY: Yes, it was 5. Pop up if you can answer this question: How many more people liked vanilla than strawberry? I will call on someone who is standing to answer and explain how they know.



STUDENTS DO: Pop up if they know the answer. Selected students answer and explain their thinking.

TEACHER SAY: Great. Pop up if you can tell me how many people liked strawberry ice cream.



STUDENTS DO: Pop up if they know the answer. Selected students answer and explain their thinking.

TEACHER SAY: Yes, 7 people liked strawberry. The bar on the graph is halfway between 6 and 8. Since 7 is between 6 and 8, we can say that 7 people liked strawberry. What is one other question that could be answered using this bar graph? Turn and share your question with your Shoulder Partner. Give me a Thumbs Up if you would like to share your question with the class and how you found the answer.



STUDENTS DO: Share a question with their **Shoulder Partner**. Give a **Thumbs Up** to volunteer. Selected students share questions and show how they found their answers.

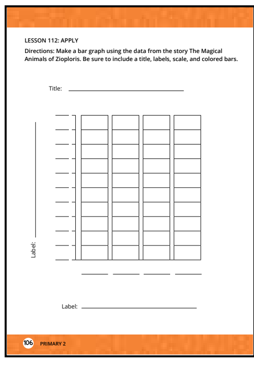
TEACHER SAY: Good questions. I am going to tell you a story about two children who live with their grandfather in the imaginary land of Zioploris.

TEACHER DO: Read the story aloud to the class. Record the data on the board at the end of the story.



STUDENTS DO: Listen to the story read aloud by the teacher.

2. TEACHER SAY: In this story, Amir and Sara decided to make a bar graph for their grandfather so he could see the magical creatures that they owned. On the board, I recorded the animals and how many of each that the story mentioned. This is the data for the graph.



Now it is your turn to create the bar graph that Sara and Amir gave to Grandfather. Take out your Mathematics Student Book and turn to page Lesson 112: Apply. You will also need your crayons.



STUDENTS DO: Find page Lesson 112: Apply. Take out crayons.

TEACHER SAY: On this page, you will see a blank bar graph like the one on the board. Your job is to create your own bar graph in your book. You decide on the scale. Be sure to label and

color each bar in your graph a different color and include a title for your graph. If you need ideas for your graph, you can look at the farm graph we did the other day.
After you have finished creating your graph, write two questions about the data and answer them. Let's begin.


STUDENTS DO: Create a bar graph using the data posted on the board. When finished with the bar graph, write and answer two questions about the graph.

Note to the Teacher: As an extension activity, have students who finish early write more than two questions and/or pose questions for other students who are finished early.

TEACHER DO: Walk around the room observing students as they make their bar graph and write and answer questions. Offer support where needed. Take note of students who are struggling to make the graph or to write and answer questions about the graph. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Nice work creating bar graphs for our story about Zioploris. Put away your crayons but keep out your student book for Reflect.**


STUDENTS DO: Put away crayons. Keep out student book.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students made their own bar graph and asked and answered questions about the data in the graph. For Reflect, they compare their graph with their **Shoulder Partner's** *graph. At the end of Reflect, collect the Mathematics Student Books to review each student's graph and the questions and answers they wrote. This may serve as an assessment of students' understanding.*

1. **TEACHER SAY:** **Today we heard a story and created a bar graph using the data provided in that story. For Reflect, share your graph with your Shoulder Partner. Compare your work. Notice what is the same and what is different about your graphs. Did you both use the same scale? Do you have the same title? Did you record the same number for each of the animals on your graphs? See if you can answer each other's questions. I will give you a few minutes.**

TEACHER DO: Give students about 3 minutes to share graphs and compare their work. Walk around and listen to student conversations.


STUDENTS DO: Share graphs with a **Shoulder Partner** and discuss similarities and differences.

TEACHER SAY: **Good work today. In our next math class, we will return to the story of Sara and Amir and Zioploris. Bring your student books to me so I can look at your graphs and read your questions and answers.**


STUDENTS DO: Give student book to the teacher.

Lesson 113 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Organize four categories of data into a pictograph. • Choose an appropriate scale based on the data being graphed. • Create and solve put-together, compare, and take-apart problems using data.	• Review vocabulary as needed.	• Calendar Math area • Large blank pictograph • Story: The Magical Animals of Zioploris, Part 2 • Crayons or colored pencils • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Make a large version of a blank pictograph. See Chapter Preparation for the Teacher for details.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students create a pictograph using data from a continuation of the story they heard in the last math lesson. They create a quiz for a classmate based on the graph data.

1. TEACHER DO: Display the large blank pictograph you created.

TEACHER SAY: In our last math class, we made a bar graph using data from the story of Amir and Sara in Zioploris. You wrote your own questions that could be answered from the graph. Today I am going to share more of Amir and Sara's story, and we are going to create pictographs based on the story. Listen carefully.

TEACHER DO: Read aloud Part 2 of the story.

 **STUDENTS DO:** Listen to the story read aloud by the teacher.

TEACHER DO: Record the new animal data on the board.

TEACHER SAY: In Part 2 of the story, Grandfather, Amir, and Sara brought added new animals to their collection. Today we are going to make pictographs to show the new animals. I have put a blank pictograph grid on the board. What title should we give this pictograph? Raise your hand if you have an idea.

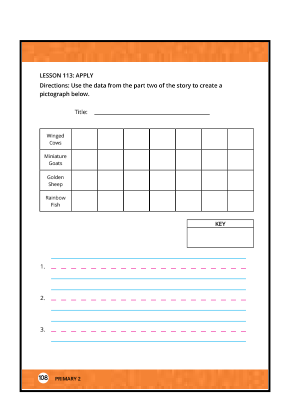
 **STUDENTS DO:** Raise hand to volunteer. Selected students share their ideas.

TEACHER DO: Write a suggested (appropriate) title on your blank pictograph.

TEACHER SAY: We also need to decide what scale to use for this pictograph. We will create a key showing the scale. Give me a Thumbs Up if you have an idea what quantity each picture should represent—1 animal, or 2, or 5, or 10?

 **STUDENTS DO:** Give a **Thumbs Up** to volunteer. Selected students share their ideas for the scale.

TEACHER DO: Discuss students' suggestions for scale and ask them to defend their choices based on the data from the story. If any students suggest a scale of 10, ask questions to help students understand why that scale does not make sense given the data.



LESSON 113: APPLY

Directions: Use the data from the part two of the story to create a pictograph below.

Title: ____________________

Winged Cows							
Miniature Goats							
Golden Sheep							
Rainbow Fish							

KEY

1. ____________________
2. ____________________
3. ____________________

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2. TEACHER SAY: Good ideas. Think about the data and decide what scale you will use. Now you will create your own pictograph in your book. Open your Mathematics Student Book to page Lesson 113: Apply. You will also need your crayons.

 **STUDENTS DO:** Open student book to page Lesson 113: Apply. Take out crayons.

TEACHER SAY: When you are finished creating your pictograph, write three questions for your Shoulder Partner to answer. When you and your Shoulder Partner are done, swap books and answer each other's questions. Make sure you know the answers because you have to check your partner's work. Do you have any questions about the directions?

TEACHER SAY: Begin working.

 **STUDENTS DO:** Create a pictograph using the new animal data posted on the board. When finished, write three questions about the graph data. Swap books with **Shoulder Partner** and answer their questions about the data. Check partner's work.

TEACHER DO: Walk around the room, observing students as they make their pictographs and write their questions. Offer support where needed. Take note of students who are struggling so you can provide additional instruction. When Learn time is over, use an **Attention Getting Signal**.

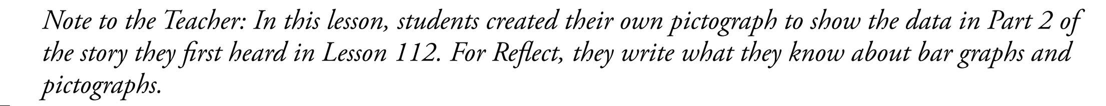
TEACHER SAY: **Good work today making pictographs and writing questions about data. Put away your crayons, but keep out your student book for Reflect.**

 **STUDENTS DO:** Put away crayons. Keep out student book.



Reflect (5 minutes)

Directions



Note to the Teacher: In this lesson, students created their own pictograph to show the data in Part 2 of the story they first heard in Lesson 112. For Reflect, they write what they know about bar graphs and pictographs.

1. **TEACHER SAY:** **Turn to page Lesson 113: Math Journal.**

 **STUDENTS DO:** Turn to page Lesson 113: Math Journal.

TEACHER SAY: **Reflect on what you have learned about bar graphs and pictographs. If you were going to teach someone else how to make bar graphs or pictographs, what would you tell them? What important helpful hints would you share? What do they need to know?**

 **STUDENTS DO:** Write a response to the prompt in the student book.

TEACHER DO: Walk around and read students' responses as they work. Be sure to read all entries at a later time. The student book provides valuable information about students' learning and progress.

TEACHER SAY: **Nice work with graphs these last three math classes. We started the year with graphs and data and are wrapping up the year with them too. In our next math lesson, we will review arrays. Put away your book and pencil.**

 **STUDENTS DO:** Put away book and pencil.

Lesson 114 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Identify real-world arrays. • Write repeated addition sentences for arrays. • Calculate the total number of objects in arrays.	• Array • Column • Equal addends • Row	• Calendar Math area • Array images • Arrays placed around the room (see Lesson Preparation) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Print Array Images Blackline Master.

For Reflect, students will look for examples of arrays in the classroom. If necessary, create arrays or place images of arrays around the room prior to the lesson to facilitate this exercise.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

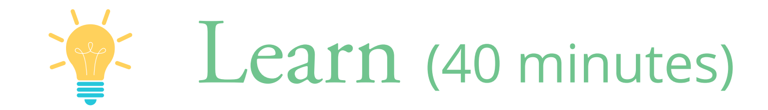
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students review arrays using real-world examples. Students explore and compare arrays and write addition sentences for arrays. Students also lead a discussion on their knowledge of arrays, acting as the teacher for this lesson.

1. **TEACHER DO:** Display the egg carton image so that students see 2 rows of 3 eggs. Display the muffin tin image so that students see 3 rows of 4.

TEACHER SAY: What do you see in these two images? Think for 30 seconds and then I will have you discuss your thinking with your Shoulder Partner.

 **STUDENTS DO:** Use **Think Time** for 30 seconds to consider the two images.

TEACHER SAY: Now discuss these two images with your Shoulder Partner. What do you see? What is in the images? How would you describe the images? How are they the same? How are they different?

 **STUDENTS DO:** Discuss the images with their **Shoulder Partner**.

TEACHER DO: Give students 1 to 2 minutes to discuss. Then use **Calling Sticks** to select four students to share what their partner saw in the images.

 **STUDENTS DO:** Selected students share their partners' observations.

TEACHER SAY: Great observations. Lean and Whisper what mathematicians call these arrangements.

 **STUDENTS DO: Lean and Whisper**: array.

TEACHER DO: If needed, remind students of the term.

TEACHER SAY: Mathematicians call these arrays. We can name the array by looking at how many rows and columns the array has. Let's look at the image of the carton of eggs. How many rows does this egg carton have? Show me on your fingers.

 **STUDENTS DO:** Show 2 fingers.

TEACHER SAY: Right. How many columns does the egg carton have?

 **STUDENTS DO:** Show 3 fingers.

TEACHER SAY: We call this a 2 by 3 array because it has two rows and three columns. We can also write addition sentences for arrays. Does anyone remember what is special about addition sentences for arrays? Raise your hand to answer.

 **STUDENTS DO:** Raise hand to volunteer. Selected students answer the question.

TEACHER DO: If students do not mention repeated addition and/or equal addends, ask questions to facilitate their thinking.

TEACHER SAY: We can add the two rows together or we can add the three columns together. Think of one of the addition sentences for this 2 by 3 array. Once you have an idea, raise your hand.

 **STUDENTS DO:** Think of an addition sentence for the array. Raise hand to volunteer. Selected students write their addition sentences on the board.

TEACHER DO: If students do not identify the correct answers, write the following on the board: $2 + 2 + 2 = 6$ or $3 + 3 = 6$.

TEACHER SAY: In the equation 2 + 2 + 2 = 6, where did the equal addends of 2 come from?

TEACHER DO: Use **Calling Sticks** to select students to respond.

 **STUDENTS DO:** Selected student answers and circles the columns on the egg carton image.

TEACHER SAY: Good job. In the equation 3 + 3 = 6, where did the equal addends of 3 come from?

TEACHER DO: Use **Calling Sticks** to select students to respond.

 **STUDENTS DO:** Selected student answers and circles the rows on the egg carton image.

2. TEACHER SAY: Wonderful job. You found the addition sentences for this 2 by 3 array. Now let's look at the muffin tin. Think of an addition sentence you could write for that array. When you are ready, raise your hand.

 **STUDENTS DO:** Look at muffin tin image and think of an addition sentence. Raise hand when ready. Selected students share their answers and circle the columns or rows that match their addition sentence.

TEACHER DO: If students do not identify the correct addition sentences, help them count the rows and columns and name the array. Then, **Model** how to write the addition sentences 3 + 3 + 3 + 3 = 12 and 4 + 4 + 4 = 12.

3. TEACHER SAY: Which of these arrays has the larger sum? How do you know? Turn and tell your Shoulder Partner. Explain how you know.

 **STUDENTS DO:** Share thinking and rationale with their **Shoulder Partner**.

TEACHER DO: Select two pairs to share their thoughts.

 **STUDENTS DO:** Selected partners share their thinking.

TEACHER SAY: Yes, the muffin tin. The sum of the addends is bigger because the muffin tin has more rows and columns.

4. TEACHER SAY: Now it is time to practice arrays on your own. Take out your Mathematics Student Book and turn to page Lesson 114: Apply.

 **STUDENTS DO:** Find page Lesson 114: Apply.

TEACHER SAY: On this page, you will see two sets of arrays—a Lego and window and a waffle and gummy bears. You will examine the first two images and write two addition sentences for each array. Then you will compare the arrays and write a sentence explaining your comparison. For example, I could compare the egg carton and muffin tin arrays and write, "The muffin tin array has a greater sum than the egg carton array." Or I might say, "The egg carton array is a smaller array than the muffin tin array." Raise your hand if you have any questions about the directions.

 **STUDENTS DO:** Raise hand to ask questions if needed.

TEACHER DO: Clarify directions if necessary.

 **STUDENTS DO:** Complete the array activity in the student book.

TEACHER DO: Walk around and observe students as they work. Take note of students who need additional support or instruction. If time allows, have students compare their work with a **Shoulder Partner's**. This will allow students to see if their equations are the same and make corrections.

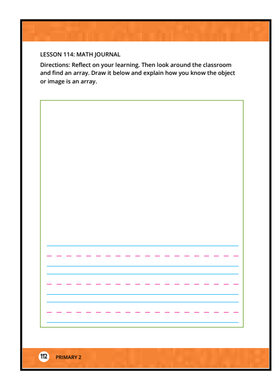
Note to the Teacher: To support students who need additional help, provide sentence stems they can use to write their comparisons. For example: The ______________ array is ___________ because ___________________________________.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students wrote equations for real-world arrays and compared arrays. For Reflect, they look for an array in the classroom. They draw the array and write about what makes that object an array.



LESSON 114: MATH JOURNAL

Directions: Reflect on your learning. Then look around the classroom and find an array. Draw it below and explain how you know the object or image is an array.

5. TEACHER SAY: Today we really put our math brains to work. We reviewed everything we had previously learned about arrays. As we reflect today, I want you to find an array in the classroom. Then draw the array you found in your student book. Open your book to page Lesson 114: Math Journal.

 **STUDENTS DO:** Open student books to page Lesson 114: Math Journal.

TEACHER SAY: You will have about 4 minutes to find your array, draw it, and write how you know it is an array. Begin.

 **STUDENTS DO:** Find an array in the classroom. Draw the array and write about what makes the object an array.

TEACHER DO: Walk around the room and read students' responses as they are working. Be sure to check all journal entries to assess student understanding.

TEACHER SAY: Thank you for your hard work today. You may put away your student book.

 **STUDENTS DO:** Put away student books.

Lesson 115 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Create arrays with given rows and columns. • Write a repeated addition sentence to express the total number of objects in an array.	• Review vocabulary as needed.	• Calendar Math area • Dice (two dice for each pair of students) • Crayons • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Gather dice for students to use to create arrays. Each pair of students will need two dice.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: Today students play a game with a partner, creating and drawing arrays. They roll dice to identify the number of rows and columns, and then draw their rolled arrays in a grid in their Mathematics Student Book. The goal is to fit the arrays on the grid so there are few or no blank squares when the game is finished. This activity requires critical thinking skills as students have to decide the best ways to position the arrays while playing the game.

This activity gives students an opportunity to apply computational thinking skills as they continue to make connections between concrete objects, patterns, and repeated addition. This process helps students build foundational understanding of the meaning of multiplication and will help them understand why multiplication is a more efficient process than repeated addition. Ask questions and allow students to share observations and questions.

1. TEACHER SAY: **During our last math lesson, we reviewed arrays. Let's Popcorn around the classroom and share some things we know about arrays.**

TEACHER DO: Select a student to begin and then allow students to **Popcorn** around the classroom to share.

 STUDENTS DO: **Popcorn** to each other to review arrays.

TEACHER DO: Help students **Count Off** to divide students into groups of 10.

 STUDENTS DO: **Count Off** to get into groups of 10.

TEACHER SAY: **Today we are going to warm up by creating human arrays. Remember, rows go from left to right and columns go up and down.**

TEACHER DO: Write "4 by 2" on the board.

TEACHER SAY: **In this array, which number is the number of rows? Show me on your fingers.**

 STUDENTS DO: Show 4 fingers.

TEACHER SAY: **How many columns? Show me on your fingers.**

 STUDENTS DO: Show 2 fingers.

TEACHER SAY: **Work with your group to build a 4 by 2 human array. Some members of your group will not be part of the array. Once you have formed your array, sit on the floor.**

 STUDENTS DO: With their groups, use their bodies to create a 4 by 2 array. Once the array is built, sit on the floor to show they are finished.

TEACHER DO: Walk around the room and assist as needed. Give students 2 to 3 minutes to build their human array. When students are finished, select one group to stand and show their array to the class.

 STUDENTS DO: Selected students demonstrate their human array.

TEACHER DO: Write "5 by 2" on the board and repeat the process.

 STUDENTS DO: Work with their group to create a 5 by 2 human array.

TEACHER SAY: **Great work. We are going to practice one more together. This time, each group will create their own array. Decide how many rows and columns you want in your array and then build a human array to match. When you are ready, sit on the floor.**



STUDENTS DO: Decide the number of rows and columns and then build a human array to match. Sit when ready.

TEACHER DO: Have each group demonstrate their array for the class. Have the other students identify the number of rows and columns. After all groups have shared their array, students will go back to their tables.

LESSON 115: APPLY

Directions: Follow the steps below.

1. One partner rolls one die to find the number of rows.
2. The other partner rolls one die to find the number of columns.
3. Write the array you rolled below (rows by columns).
4. Draw the array on your grid.
   - Try to think of the best place to put your array so you can fit more arrays on your grid. The goal is to have few or no blank squares left at the end of the game.
5. Color and label the array (on the grid).
6. Write one addition sentence for the array.

1. ______ by ______
Addition sentence: ____________

5. ______ by ______
Addition sentence: ____________

2. ______ by ______
Addition sentence: ____________

6. ______ by ______
Addition sentence: ____________

3. ______ by ______
Addition sentence: ____________

7. ______ by ______
Addition sentence: ____________

4. ______ by ______
Addition sentence: ____________

8. ______ by ______
Addition sentence: ____________

114 PRIMARY 2

2. TEACHER SAY: Now you are going to play a game with your Shoulder Partner. The game is called Array Blocks. I am going to give you and your partner a pair of dice. While I am handing them out, turn to page Lesson 115: Apply in your Mathematics Student Book.



STUDENTS DO: Turn to page Lesson 115: Apply in the student book.

TEACHER DO: Hand out two dice to each set of **Shoulder Partners**.

TEACHER SAY: You and your partner have two dice. One of you will be Rows and the other will be Columns. If you are Rows, when you roll your die, your number is the number of rows in your array.

TEACHER DO: Roll one die. Write the number on the board. (For example, if you rolled a 3, you would write 3 by ______.)

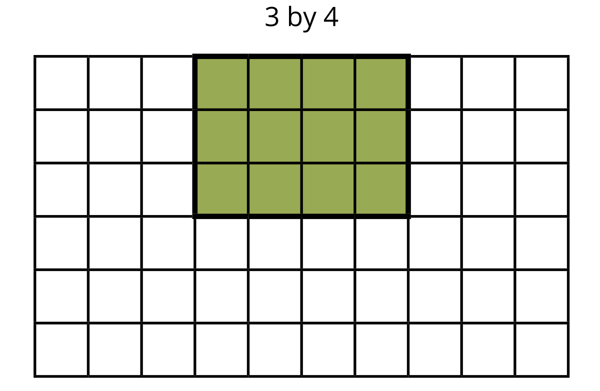
TEACHER SAY: If you are Columns, when you roll your die, your number is the number of columns in your array.

TEACHER DO: Roll the second die. Write the number on the board. (If you roll a 4, you would write 3 by 4.)

TEACHER SAY: Now my partner and I each draw a 3 by 4 array on our grids. Then we write the name of the array inside it and color it lightly. Let me show you how I might draw this array on a grid.

TEACHER DO: Draw a small grid on the board and add the 3 by 4 array. Explain that you are drawing your array with three rows and four columns.

3 by 4



TEACHER SAY: Finally, I write one of the repeated addition sentences for this array.

TEACHER DO: Write 3 + 3 + 3 + 3 = 12 on the board.

TEACHER SAY: You will play the game the exact same way. However, one very important part of this game is that you and your partner do NOT have to draw your arrays in the same place in your grids. That is because the goal of the game is to fit as many arrays as you can and have the fewest number of blank squares left over. So you have to think carefully about where you will put each array.



STUDENTS DO: Play Array Blocks with their **Shoulder Partner**. Roll the dice to identify rows and columns. Draw, label, and color the arrays. Write one repeated addition sentence for each array.

TEACHER DO: Monitor the groups as they play, assisting as needed.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students built arrays using a given number of rows and columns and drew the arrays on a grid. Students reflect on today's lesson by comparing their finished grid with their **Shoulder Partner's***. Partners discuss the strategies they used to place their arrays in their grids.*

1. **TEACHER SAY: Today you and your Shoulder Partner both created the same size arrays and placed them in your grid. As we reflect today, compare your completed grids. How are they the same? How are they different? Who has the fewest number of blank squares left over? Would you rearrange any of the arrays if you could? Discuss these questions with your partner.**

 **STUDENTS DO:** Compare array grids with their **Shoulder Partner's** and discuss the results.

TEACHER DO: Allow students 4 to 5 minutes to compare and discuss their array grids with their partners.

TEACHER SAY: That was a fun day of math. I enjoyed hearing you compare your work and your strategies. Put away your student book and give your partner a high five.

 **STUDENTS DO:** Put away books and give partners a high five.

Lesson 116 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add and subtract 1-, 2-, and 3-digit numbers. • Apply a variety of strategies to solve problems. • Identify and correct errors in their work and the work of others.	• Review vocabulary as needed.	• Calendar Math area • Place value materials from Lesson 84 • HTO Charts (one per student) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Have available the place value materials from Lesson 84.

Print sets of Hundreds–Tens–Ones Charts (one per student). See the HTO Charts Blackline Master.



Calendar Math (15 minutes)

Directions

1. **TEACHER DO:** Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
    - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. **TEACHER SAY: Today we are going to review _____ (topic).**

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: In the next three lessons, students strengthen their skills in adding and subtracting multidigit numbers, an anchor skill developed in Primary 2. In today's lesson, students apply a variety of strategies to solve problems, demonstrating flexible thinking when posed with addition and subtraction problems. This lesson provides a process for modeling different strategies. However, you may choose which strategies to model as long as you show multiple strategies that have been discussed throughout the year, including decomposing numbers into Hundreds, Tens, and Ones, adding on, and regrouping. Students may have other strategies that work for them, but be sure they can explain the strategy and use it successfully.

Testing theories and understandings and improving work is part of computational thinking. This lesson provides additional practice in identifying and correcting errors which involves testing processes, determining where things went wrong, and making corrections. This process also helps students understand that mistakes are a very important part of the learning process and cannot be avoided.

1. TEACHER DO: Write 67 + 45 = _____ on the board.

TEACHER SAY: I have written an addition problem on the board. I want you to work with your Shoulder Partner to find the answer to this problem. However, I want you to solve the problem using mental math strategies— not paper and pencil. Give me a Thumbs Up when you have an answer to the problem.



STUDENTS DO: Work with their **Shoulder Partner** to solve the problem using mental math strategies.

TEACHER DO: Give students a minute or two to solve the problem mentally, and then use **Calling Sticks** to select pairs to share their answers.



STUDENTS DO: Selected pair shares their answer.

TEACHER DO: Record the answer on the board. Then ask if anyone has a different answer. If someone shares the same answer, make a check mark next to it instead of rewriting. Repeat until there are a few different answers on the board.

Note to the Teacher: It is highly unlikely that all students will have the correct answer at first. This exercise helps you identify students' misconceptions and mental errors and gives students an opportunity to self-correct. Math dialogue is where deep understanding develops, so be patient, ask for different answers, and be open to all suggestions.

TEACHER SAY: We do not all have the same answer, so let's hear how some of you found your answer. I will ask you to explain the mental math strategies you used. We can learn a lot from other people's thinking, so let's listen carefully to each other.

TEACHER DO: Choose an answer on the board that is incorrect. Allow students who got that answer to share their thinking. They may find their error in the process, but if they do not, ask questions that guide them to find the error. You can also ask other students if they can spot where the error happened and explain how to fix it. Repeat this process for other incorrect answers (if there are any) and then call on a student who has the correct answer to share. If there are a lot of wrong answers and you are concerned about spending too much lesson time on this exercise, choose only one incorrect answer and the correct answer to analyze.



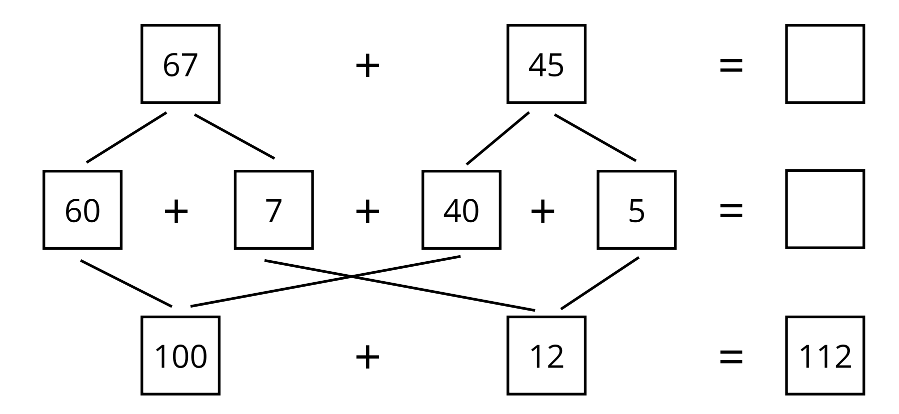
STUDENTS DO: Selected students share how they found their answers. Other students listen to their strategies and, if possible, help correct errors.

TEACHER SAY: Good job. We had some different answers for this addition problem, but we finally determined that the correct answer is 112.

Note to the Teacher: When students shared their mental math strategies, they may have modeled decomposing, or thinking of the problem as Tens and Ones. If so, use the following **Think Aloud** *to quickly reinforce the strategy, mentioning that you are solving it the way several students did.*

TEACHER SAY: I am going to do a Think Aloud and model how I solved this problem. I decomposed the addends. I broke the numbers into Tens and Ones and put them back together in my head.

TEACHER DO: On the board decompose 67 and 45.



TEACHER SAY: To solve, I thought of the problem as 6 Tens plus 4 Tens, which is 10 Tens. How much is 10 Tens?

 **STUDENTS DO:** Respond: 100.

TEACHER SAY: Yes, 100. Then I thought of 7 Ones plus 5 Ones, which is 12 Ones. 100 + 12 = 112.

TEACHER DO: If any students are eager to share their mental math strategies (and got the correct answer), allow them to do so.

TEACHER SAY: Great. Now let's look at another problem.

TEACHER DO: Write 72 – 28 = ______ on the board.

TEACHER SAY: Work with your Shoulder Partner to solve this problem using mental math strategies.

 **STUDENTS DO:** Work with their **Shoulder Partner** to solve the problem using mental math strategies.

TEACHER DO: Give students a minute or two to solve the problem mentally, and then use **Calling Sticks** to select pairs to share their answers.

 **STUDENTS DO:** Selected pairs share their answer.

TEACHER DO: Follow the same procedure as above: Have several pairs share their answers. Ask students who got incorrect answers to explain their strategies. Ask all students to help identify and correct answers. Have another pair of students explain how they got the correct answer.

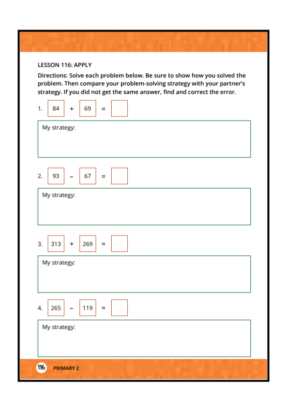
TEACHER DO: **Model** the following mental math strategy (or reinforce it if any students shared it):

- 72 – 2 Tens = 52
- 52 – 2 Ones = 50
- 50 – 6 Ones = 44

Students might also recognize that 8 is 2 away from 10 and say 52 – 1 Ten = 42 + 2 Ones = 44.

 **STUDENTS DO:** Watch the teacher model mental math strategies.

2. TEACHER SAY: Good work. There are many ways to solve addition and subtraction problems. We have seen several strategies today. Now you are going to practice using all of the strategies you have learned to solve addition and subtraction problems. Take out your Mathematics Student Book and turn to page Lesson 116: Apply.



LESSON 116: APPLY

Directions: Solve each problem below. Be sure to show how you solved the problem. Then compare your problem-solving strategy with your partner's strategy. If you did not get the same answer, find and correct the error.

1. 84 + 69 = ☐

My strategy:

2. 93 – 67 = ☐

My strategy:

3. 313 + 269 = ☐

My strategy:

4. 265 – 119 = ☐

My strategy:

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STUDENTS DO: Take out Mathematics Student Book and turn to page Lesson 116: Apply.

TEACHER SAY: **On this page, you will see four problems. Under each problem is a box. Solve each problem and show your work in the boxes. For example, if you use a mental math strategy, show how you did it in the box just as I did on the board. If you use regrouping, show that. After you solve the problems, you and your Shoulder Partner will compare answers and problem-solving strategies. If you do not have the same answer, work together to figure out the correct answer. I have place value materials and Hundreds-Tens-Ones charts—or HTO Charts—for you to use if you want to. Just be sure to explain how you solved each problem.**



STUDENTS DO: Retrieve place value materials if needed. Solve the problems in the student book, showing work. When finished, compare answers and strategies with their **Shoulder Partner**. Identify and correct errors.

TEACHER DO: Walk around and observe students as they solve addition and subtraction problems. Take note of the strategies students are using, particularly which students are using mental math strategies, which are regrouping with ease, and which are relying on place value manipulatives or drawings. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **Good work today. I noticed that many of you used different strategies as you worked to solve the problems. And I enjoyed listening to your conversations with your partners. Keep out your Mathematics Student Book and pencil for Reflect.**



Reflect (5 minutes)

Directions

LESSON 116: MATH JOURNAL

Directions: Reflect on your learning. In the box below, respond to the following questions.

- What is your favorite addition strategy? Why?
- What is your favorite subtraction strategy? Why?
- Include examples to support your thinking.

Addition

Subtraction

PRIMARY 2 117

Note to the Teacher: For Reflect, students write about their favorite strategies for solving addition and subtraction problems and explain why.

1. TEACHER SAY: **Turn to page Lesson 116: Math Journal in your student book.**



STUDENTS DO: Turn to page Lesson 116: Math Journal in the student book.

TEACHER SAY: **Today we practiced adding and subtracting large numbers. I asked you to use any math strategies you have learned this year— mental math strategies, the regrouping process, HTO Charts, place value materials, and so on. For Reflect, I want you to think about your favorite strategy for solving addition and subtraction problems and explain why it is your favorite. Record your thinking on the Math Journal page. Share an example for addition and subtraction.**



STUDENTS DO: Respond to the journal prompt.

TEACHER DO: As students write, walk around and read some of their entries. Be sure to read all of the entries at a later time so you can identify students who are ready for a challenge and students who need additional support practicing strategies or correcting misconceptions.

TEACHER SAY: **Good work today. Put away your student book for today.**



STUDENTS DO: Put away materials.

Lesson 117 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Add and subtract 2- and 3-digit numbers. • Write story problems for addition and subtraction equations. • Apply a variety of strategies to solve addition and subtraction story problems.	• Review vocabulary as needed.	• Calendar Math area • Place value materials from Lesson 84 • HTO Charts (one per student) • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Have available the place value materials from Lesson 84.

Print sets of Hundreds–Tens–Ones Charts (one per student). See the HTO Charts Blackline Master.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students choose an addition or subtraction problem and write a story problem to go with it. Then they will solve the problem. A list of basic and more challenging problems is provided, but feel free to alter the problems to meet the needs of your students. Also, allowing students to choose the problems they will work on enables them to demonstrate skills at their comfort level and gives them responsibility for their own learning. However, you can assign problems or suggest problems as needed to ensure all students are appropriately challenged.

Students have worked for several months on building competency in computation. This lesson asks students to apply their learning in a different way—by defining the problem themselves. This is a key practice in computational thinking. Approaching problem solving by writing a story problem requires students to demonstrate that they understand what addition and subtraction mean and can share that understanding with others.

1. TEACHER DO: Write the following problems on the board:

- 34 + 88 = ______
- 82 – 38 = ______
- 140 – 65 = ______
- 86 + 95 = ______
- 218 + 85 = ______
- 184 – 29 = ______
- 358 + 257 = ______
- 230 – 157 = ______
- 347 + 256 = ______
- 500 – 256 = ______

TEACHER SAY: In our last math class, we explored different strategies for solving addition and subtraction problems. Today you are going to challenge yourselves by writing story problems and solving them. Let's look at the problems I wrote on the board. There are a lot of them. Some have 2-digit numbers. Others have 3-digit numbers.

Look at 34 + 88. Talk to your Shoulder Partner. Work together to think of a story problem to fit this addition equation. Give me a Thumbs Up when you have a story problem to share. I cannot wait to hear your ideas.



STUDENTS DO: Work with their **Shoulder Partner** to think of a story problem for 34 + 88. Give a **Thumbs Up** when ready to share.

TEACHER DO: Give students at least 1 minute to create a story problem. Use **Calling Sticks** to choose three or four pairs to share their story problems with the class. Record them on the board. If necessary help students include language such as "in all," "all together," "find the sum," and so on.

TEACHER SAY: Good job. You are so good at coming up with creative story problems. Remember, words like "in all," "all together," and "find the sum" help readers know that they are going to add the numbers in the story.

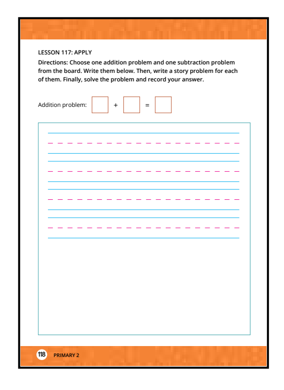
TEACHER DO: Circle the addition clue words in the story problems you wrote on the board.

TEACHER SAY: Now let's look at the subtraction problem 82 – 38. Since this is a subtraction problem, we need to think of a story problem where we find the difference. Work with your Shoulder Partner to think of a story problem for 82 – 38. Give me a Thumbs Up when you are ready.



STUDENTS DO: Work with **Shoulder Partner** to think of a story problem for 82 – 38. Give a **Thumbs Up** when ready to share.

TEACHER DO: Repeat the process as you did for the addition problem. Call on three or four pairs to share. Help students use words such as "how many are left," "how many more," "what is the difference," and so on. Circle those words in the students' story problems.


LESSON 117: APPLY
Directions: Choose one addition problem and one subtraction problem from the board. Write them below. Then, write a story problem for each of them. Finally, solve the problem and record your answer.
Addition problem: ☐ + ☐ = ☐

2. **TEACHER SAY:** **Nice work. Now it is your turn. Take out your Mathematics Student Book and turn to page Lesson 117: Apply.**

 **STUDENTS DO:** Find page Lesson 117: Apply.

TEACHER SAY: **There are two boxes on this page. Your job is to choose one addition and one subtraction problem from the list on the board. Record the problems you chose and then write a story problem for each one. Finally, solve the problems and record your answers.**
Choose a problem from the list that is just right for you. It is okay to choose the problems we did together, but you must write your own unique story problem and not use one on the board already. Remember to include words that help us know if we should add or subtract to solve the problems.

I have place value materials and HTO charts if you need them to help solve your story problem.

Note to the Teacher: As an alternative activity, have students write a story problem and then ask a partner solve it. This may provide a challenge for students who are ready for it. To support students who need additional help, have them work in groups to write and solve story problems.

 **STUDENTS DO:** Choose an addition and subtraction problem and write story problems for them. Solve to find the answer.

TEACHER DO: Walk around and observe students as they work. Take note of which problems students choose (and which problems they avoid). Guide students to choose problems at an appropriate level of challenge. Identify students who need additional instruction or support. When Learn time is over, use an **Attention Getting Signal**.

TEACHER SAY: **I really enjoyed reading your story problems. You are so creative. That was fun. Keep out your student book and pencil for Reflect.**



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect today, students share their story problems with a new partner.

1. **TEACHER SAY:** **For Reflect, you will share your story problems and answers with a new partner. Let's do Hands Up, Pair Up to find partners.**

 **STUDENTS DO:** Do **Hands Up, Pair Up** to find a new partner.

TEACHER SAY: **Read your partner's story problem, talk about the strategies you used to solve the problems, and check each other's answers.**

 **STUDENTS DO:** Share story problems with partner. Compare problem-solving strategies and check each other's answers.

TEACHER DO: Give students about 4 minutes to work. Walk around and listen to students' conversations.

TEACHER SAY: **Nice work. Give your partner a high five and put away your book for today.**

 **STUDENTS DO:** High-five partners and put away materials.

Lesson 118 Overview

LEARNING OBJECTIVES

Students will:
- Participate in Calendar Math activities.
- Add and subtract 2- and 3-digit numbers.
- Collaborate to play a math game.
- Evaluate their progress in adding and subtracting with regrouping.

KEY VOCABULARY

- Review vocabulary as needed.

MATERIALS

- Calendar Math area
- Playing pieces (one per student)
- Regrouping Game Cards (one set for each group)
- Game Answer Key (for the teacher only)
- Dice (one die for each group)
- Place value materials from Lesson 84
- HTO Charts
- Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create sets of Regrouping Game Cards (one set per small group of students). See the Regrouping Game Cards Blackline Master.

Gather playing pieces for students to use as they play the game. Each student in a group will need a unique token.

Gather dice (one die per small group of students).

Have available the place value materials from Lesson 84 and copies of the HTO chart.

Create a poster listing the game rules. See Chapter Preparation for the Teacher for details.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:
- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students play a board game in groups of three or four. The game requires students to add and subtract multidigit numbers. Students can support each other as they work and should check each other's answers. An Answer Key is provided for your reference.

1. TEACHER DO: Display the poster of game rules. Record the follow problems on the board:

TEACHER SAY: Look at the problems on the board. Give me a Thumbs Up if you notice anything that both of these problems have in common.



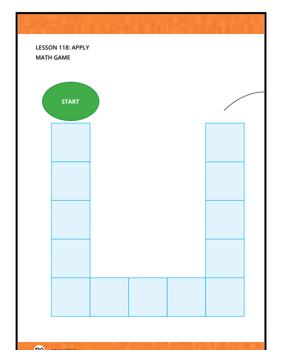
STUDENTS DO: Give a **Thumbs Up** to share what the problems have in common. Selected students share their thinking.

TEACHER DO: If no one mentions that both problems require regrouping, be sure to point that out. Students may also note that the problems are written vertically and include 3-digit numbers.

TEACHER SAY: I carefully lined up the numbers in the problems so that the Ones, Tens, and Hundreds in each number are in the same column. This helps me solve problems that involve regrouping. Let's look at the first problem.

Note to the Teacher: If students have shown that they understand regrouping, the following in-depth review may not be necessary. Instead, consider having students model how to regroup on the board using the problems posted.

2. TEACHER DO: Walk through the process of regrouping, first with the addition problem and then with the subtraction problem. Have students help by describing the steps involved in regrouping and sharing answers. Do a **Think Aloud** as you regroup to make sure students understand what you are doing and how the process is related to the physical process of regrouping they have practiced with straws and drawings.



3. TEACHER SAY: Good work. Thank you for your help. Let's play a game. Open your Mathematics Student Book to page Lesson 118: Apply.



STUDENTS DO: Open student books to page Lesson 118: Apply.

TEACHER SAY: There is a game board on these two pages. You will play this game in teams. Let's read the directions for the game.

TEACHER DO: Read the rules aloud from the poster created during Chapter Preparation. Answer students' questions about the game. Show three sample game cards—one with just numbers, one with a story problem, and one with a movement direction for players.

TEACHER SAY: Each of the game cards has an addition or a subtraction problem, a story problem, or a direction like "lose a turn." Solve the problems or follow the directions on the cards to play the game. You can help each other.

Note to the Teacher: Some of your students may still struggle with the regrouping strategy, especially with subtraction. Have place value materials and HTO charts available to support those who might need it.

TEACHER SAY: Let's use Hands Up, Pair Up to find partners.



STUDENTS DO: Use **Hands Up, Pair Up** to find a partner.

TEACHER SAY: The two of you will be a team. Now find another team of two and find a place to play. I will bring you a die, a set of game cards, and game pieces. Each of you will need one game piece.



STUDENTS DO: Find another set of partners.

TEACHER DO: Hand out supplies to each small group. Remind students they can use place value materials or HTO charts as needed.

 **STUDENTS DO:** Play the game with their small group.

TEACHER DO: Walk around the class observing students as they play the game. Offer help as needed. Have the Answer Key available if necessary. Near the end of Learn time, use an **Attention Getting Signal**.

TEACHER SAY: **Great work playing the game today. Please clean up and bring me all of the materials. Then return to your seats. You will need your student book for Reflect.**

 **STUDENTS DO:** Clean up materials and return them to the teacher.

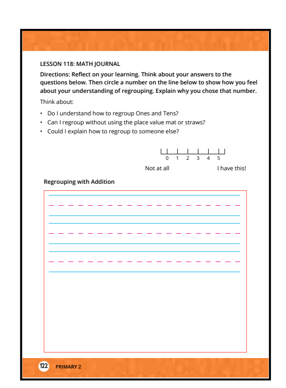


Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students played a game to practice regrouping. For Reflect, they evaluate their level of comfort with regrouping. This is the last lesson of the school year that involves regrouping, so this exercise provides valuable information to students and to you as you prepare them to move on to Primary 3.

1. **TEACHER SAY:** **We have worked all year to learn a variety of strategies for adding and subtracting 1-, 2-, and 3-digit numbers. One of the new strategies that we learned was regrouping. For Reflect today, think about how comfortable you feel with regrouping to add and to subtract. Turn to page Lesson 118: Math Journal in your student book.**


LESSON 118: MATH JOURNAL

Directions: Reflect on your learning. Think about your answers to the questions below. Then circle a number on the line below to show how you feel about your understanding of regrouping. Explain why you chose that number.

Think about:

- Do I understand how to regroup Ones and Tens?
- Can I regroup without using the place value mat or straws?
- Could I explain how to regroup to someone else?

0 1 2 3 4 5

Not at all I have this!

Regrouping with Addition

122 PRIMARY 2

 **STUDENTS DO:** Turn to page Lesson 118: Math Journal.

TEACHER SAY: **In your book, you see number lines labeled 0 to 5. There is a number line for regrouping with addition and one for regrouping with subtraction. You may feel differently about each. A 1 or a 2 means that you think regrouping is still challenging and you need more practice. A 4 or a 5 means you feel very comfortable solving problems with regrouping. A 3 is right in the middle. It means that sometimes you feel okay and sometimes you need help.**

Use the questions to help you reflect on your learning. Circle a number on the line that shows how you are feeling about your regrouping skills. After you circle each number, write about why you chose the number you did.

 **STUDENTS DO:** Reflect on their learning and then circle numbers to show their current level of understanding of regrouping in addition and subtraction problems. Write an explanation for their personal ratings.

TEACHER DO: Give students 3 to 4 minutes to respond to the prompt. Collect student books to review students' self-evaluations.

TEACHER SAY: **Nice work. In our next math lesson, we will think about all the math skills and concepts we have learned this year in Primary 2. Give yourself a hug.**

 **STUDENTS DO:** Hug themselves.

Lesson 119 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Reflect on their learning in Primary 2 Mathematics. • Describe major skills and concepts learned in Primary 2.	• Review vocabulary as needed.	• Calendar Math area • Large Big 5 chart • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

Create a large chart for review of the five major areas of mathematics (the "Big 5") covered in Primary 2: Operations and Algebraic Thinking, Numbers and Operations in Base Ten, Measurement, Data, and Geometry.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.



Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students begin a project writing a letter to an upcoming Primary 2 student to share some of the most important concepts they will learn during Primary 2. You facilitate the discussion as students share what they know about each of the five major areas of mathematics covered this school year (the "Big 5"). Students take notes during the whole-group discussion, select three topics to write about, and work independently to add more details to their graphic organizer related to those three topics.

1. TEACHER SAY: We are almost to the end of Primary 2. We have learned so many new things during math this year. When you first came to Primary 2, you may have felt a little nervous or

anxious. You did not know what to expect, and you were curious to know what you might learn during the year. Next year, there will be a new group of Primary 2 students.

We are going to spend two days planning, organizing, and writing a letter to upcoming Primary 2 students about what they can expect to learn in math during Primary 2. In order to do that, we need to review the five most important areas of math, or the Big 5, from this year.

TEACHER DO: Display the large Big 5 chart.

TEACHER SAY: Turn to page Lesson 119: Apply in your Mathematics Student Book.



STUDENTS DO: Turn to page Lesson 119: Apply in the student book.

TEACHER SAY: I have a large chart for the Big 5 of Primary 2 on the board. You have the same chart in your book. Together we will list some of the most important ideas we covered in each category. You will take notes on your chart, just as I will on mine. Later you will use these notes to write your letter, so take good notes.

TEACHER DO: Point to the first category on the chart: Operations and Algebraic Thinking.

TEACHER SAY: The first category is Operations and Algebraic Thinking. This includes addition and subtraction, solving story problems, even and odd numbers, and arrays.

TEACHER DO: Write these topics on the chart under Operations and Algebraic Thinking, leaving room under each for students' thoughts.

TEACHER SAY: Raise your hand to share some of the things you remember about each of these main ideas. You can share helpful hints, thoughts, examples, or anything you remember learning about the topic.



STUDENTS DO: Raise their hand to share what they remember about each main idea.

TEACHER DO: Record students' ideas in the appropriate areas on the chart. Ask questions to prompt discussion if students get stuck, but try not to provide too much information.



STUDENTS DO: Take notes on their chart based on the class discussion.

TEACHER DO: Continue with each of the Big 5 categories. Spend about 5 minutes reviewing each category and writing students' thoughts on the chart. The topics for each category are listed below. Remember to leave space under each topic for students' ideas.

The Big 5 of Primary 2		
Operations and Algebraic Thinking	• Adding • Subtracting • Story Problems	• Even and Odd Numbers • Arrays
Numbers and Operations in Base Ten	• Place Value • Count by 5, 10, 100 • Numerical Patterns • Word Form and Expanded Form	• Comparing Numbers • Estimating • Regrouping
Measurement	• Estimating and Measuring Length • Estimating and Measuring Mass	• Money • Time • Calendar
Data	• Bar Graphs • Pictographs	
Geometry	• 2D Shapes • 3D Shapes	• Fractions of a Shape • Fractions of a Set

TEACHER SAY: Look, our Big 5 organizer is completely filled in. We sure did learn a lot in math this year. Now it is time for you to decide which three topics you would like to write about. Choose topics from three different categories. For example, I may choose to write about arrays, money, and 3D shapes. Once you decide on three topics, write them at the top of the chart on the next page in your book.

STUDENTS DO: Select their Top 3 topics from the organizer and write them at the top of the chart on the next page in the student book.

TEACHER SAY: Now that you have identified your Top 3 topics, think about what you would like to talk about in your letter. What would you like to tell the future Primary 2 student about those topics. Write your notes in the new chart. You may use the information on the Big 5 chart and add more details. Include examples in your notes.

STUDENTS DO: Look at the notes on the Big 5 chart and decide what information they would like to share about each topic. Add their notes to the Top 3 chart.

TEACHER DO: Walk around the classroom and help students as needed.



Reflect (5 minutes)

Directions

Note to the Teacher: In this lesson, students began the process of writing a letter to an upcoming Primary 2 student by discussing what they learned this year and recording the information on graphic organizers. Today for Reflect, students share their Top 3 charts with their **Shoulder Partner**. *They explain their thinking and provide additional topic suggestions to their partner.*

1. TEACHER SAY: **Today we reviewed the Big 5 of Primary 2. We worked together and on our own to think about everything we learned this year. Today you will reflect by sharing your Top 3 chart with your Shoulder Partner. Share your notes and offer suggestions for more information your partner can add to their chart.**

 STUDENTS DO: Share Top 3 chart with their **Shoulder Partner** and offer partner suggestions for additional information to include in their chart.

TEACHER SAY: **We will use these charts to write our letters tomorrow. You may put away your student book now.**

 STUDENTS DO: Put away student books.

Lesson 120 Overview

LEARNING OBJECTIVES	KEY VOCABULARY	MATERIALS
Students will: • Participate in Calendar Math activities. • Reflect on their learning in Primary 2 Mathematics. • Describe major skills and concepts learned in Primary 2. • Write a letter describing major skills and concepts learned in Primary 2.	• Review vocabulary as needed.	• Calendar Math area • Large Big 5 chart • Mathematics Student Book and pencil

LESSON PREPARATION FOR THE TEACHER

No new preparation needed.



Calendar Math (15 minutes)

Directions

1. TEACHER DO: Use the **Calling Sticks** to select one student.



STUDENTS DO: Selected student leads Calendar Math—the day and date section as well as the number of days in school section. All students participate.

TEACHER DO: Guide student helper through the procedure, including the following:

- Current month
- All months of the year
- Current day
- All days of the week
- Today's date: Today is (day of week) the (date) of (month) (year).
- Yesterday and tomorrow
- Days in school (place value pockets, circle 120 Chart, count aloud)
  - Every 10th day, help students regroup the straws and move the new bundle of 10 to the Tens pocket.

2. TEACHER SAY: Today we are going to review _____ (topic).

TEACHER DO: Facilitate review activity. Select an activity from Lesson 111 or choose a different review exercise.



STUDENTS DO: Participate in the review activity.

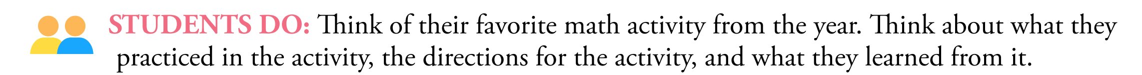
Learn (40 minutes)

Directions

Note to the Teacher: In today's lesson, students use their Top 3 charts to write a letter to an upcoming Primary 2 student. The goal of this letter is to gather information about students' knowledge of the main mathematics skills and concepts covered this year. When a student is able to teach another student about a topic, true understanding has been achieved.

1. TEACHER SAY: **During our last math lesson, we reviewed the Big 5 from Primary 2. Let's play a quick game to review some of the things we learned this year. I want you to think of your favorite activity we did in math this year. Think about what you were practicing, the directions for the activity, and what you learned from it. You are going to share this activity with a partner. Each partner will have 30 seconds to share. First, think of the activity you want to talk about.**

TEACHER DO: Allow 30 seconds of **Think Time** for students to think of their favorite activity.



STUDENTS DO: Think of their favorite math activity from the year. Think about what they practiced in the activity, the directions for the activity, and what they learned from it.

TEACHER SAY: **Now, let's find partners using Hands Up, Pair Up.**



STUDENTS DO: Find a partner using **Hands Up, Pair Up**.

TEACHER DO: Give a signal for the first partner to share. Allow 30 seconds to share. Then give a signal for the second partner to share.

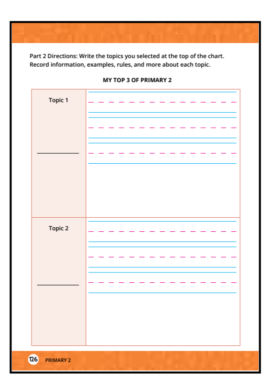


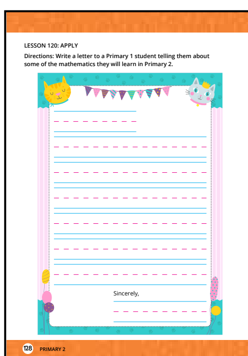
STUDENTS DO: Share a favorite math activity with a partner when the teacher gives the signal.

TEACHER SAY: **Great. Now find another partner and share again.**



STUDENTS DO: Use **Hands Up, Pair Up** to find another partner. Share their favorite activities when the teacher gives the signal.





TEACHER DO: Repeat two times so students get to hear several different activities. This will help remind them of different activities they may choose to include in their writing.

2. TEACHER SAY: **Now it is time to start writing our letters. Turn to page Lesson 119: Apply in your Mathematics Student Book. Here you will see the Top 3 chart you created during our last math lesson. You will use this to help you write your letter.**



STUDENTS DO: Turn to page Lesson 119: Apply in the student book.

TEACHER SAY: **On the next page, there is a place for you to write your letter. Before we begin writing, let's talk about the format of our letters. First, we will write a greeting. Remember we are writing our letters to a new Primary 2 student, so how might we greet them? If you have an idea, raise your hand.**



STUDENTS DO: Raise hand to volunteer. Selected students share their ideas for greetings.

TEACHER DO: Decide on a greeting (or two) that students can use. Write it on the board. Write the remaining format on the board as you discuss it:

Greeting,

Topic 1: (Name the topic, share at least one idea about the topic, draw one example)
Topic 2: (Name the topic, share at least one idea about the topic, draw one example)
Topic 3: (Name the topic, share at least one idea about the topic, draw one example)

Sincerely,
Your name

TEACHER SAY: You may share more than one idea or more than one example, but you must include at least one. Begin writing. If you need help as you are working, raise your hand. I will help you.

 **STUDENTS DO:** Write a letter to a new Primary 2 student using their Top 3 chart.

Note to the Teacher: As an accommodation for students who need additional support, create a fill-in-the-blank type of template for students to use to create their letters.

TEACHER DO: At the end of Learn time, use an **Attention Getting Signal**.

TEACHER SAY: Keep out your student book for Reflect.



Reflect (5 minutes)

Directions

Note to the Teacher: For Reflect, students share letters with their **Shoulder Partner***. Partners offer each other feedback.*

1. TEACHER SAY: **Today you wrote letters to new Primary 2 students. You told them three important math topics they will learn next year. You included details and examples so they will know what to expect. For Reflect today, I want you to share your letter with your Shoulder Partner. Read your partner's letter and give them feedback. What was your favorite part of their letter? What can they do to improve it?**

 STUDENTS DO: Share letters with a **Shoulder Partner**. Share favorite part of the partner's letter and provide suggestions for improvement.

TEACHER SAY: **I am so happy with how hard each of you worked in math this year. Give your Shoulder Partner a high five for being such a great math partner this year.**

 STUDENTS DO: Give **Shoulder Partner** a high five.

TEACHER DO: Collect students' books.

Array Images





Build-a-Fraction Cards

One-Half	1/4	Two-Thirds
4/4 or One Whole	You Decide	1/3
Three-Fourths	1/2	One Whole
3/4	2/2	2/3

Cluster Card Set

Card A	Card B
56 – 10 = 56 – 20 = 56 – 30 = 56 – 36 = 56 – 37 =	91 – 10 = 91 – 20 = 91 – 30 = 91 – 31 = 91 – 32 =
Card C	**Card D**
180 – 10 = 180 – 20 = 180 – 50 = 180 – 100= 180 – 99 =	132 – 10 = 132 – 20 = 132 – 30 = 132 – 100 = 132 – 99 =
Card E	**Card F**
82 – 10 = 82 – 30 = 82 – 50 = 82 – 52 = 82 – 54 =	71 – 10 = 71 – 30 = 71 – 50 = 71 – 51 = 71 – 53 =
Card G	**Card H**
345 – 10 = 345 – 30 = 345 – 40 = 345 – 45 = 345 – 48 =	563 – 100 = 563 – 130 = 563 – 160 = 563 – 163 = 563 – 165 =

Fraction Flag Label

My Fraction Flag of

____

Description of each section:

______/______ is __________________

______/______ is __________________

______/______ is __________________

______/______ is __________________

Fraction Story Problem Cards

Card A Rena had 4 cookies in her lunch. She gave her friend Aya 2 of them. What fraction of the cookies did Rena share?	Card B Omar went out for pizza. His pizza had 3 slices and he ate 2 of them. What fraction of the pizza is left?
Card C Karim had a sandwich. He cut it into two pieces and ate one. What fraction of the sandwich did he eat?	**Card D** Farah and Sherif picked flowers. They had four flowers. Farah took 3 of the flowers and gave one to Sherif. What fraction of the flowers did Farah take?
Card E Sara baked a pie and cut it into four pieces. Her family ate 3 of the pieces. What fraction of the pie is left over?	**Card F** Naseem was in charge of the soccer balls for the team. He brought three of them to practice, but two of them were flat. What fraction of the soccer balls could Naseem use?
Card G On the way to school, Miro found four blue rocks and put them in his pocket. When he got to school he only had three. What fraction of the rocks fell out?	**Card H** Dina had three cookies in her lunch. If she ate all three of them, what fraction of the cookies did she eat?
Card I* Wassem went out for pizza. The pizza was cut into 6 slices and he ate 2 of them. What fraction of the pizza did Wassem eat?	**Card J*** Rania picked flowers for her mother. She picked 6 of them. 4 were red and 2 were orange. What fraction of the flowers were red?

Hundreds–Tens–Ones Charts

Hundreds	Tens	Ones

Hundreds	Tens	Ones

Hundreds	Tens	Ones

Hundreds	Tens	Ones

The Magical Animals of Zioploris
Part 1

Once upon a time, in the magical land of Zioploris, two children lived with their grandfather in a small but beautiful tent made of colorful cloth. Their little tent was alone on a hillside looking out over a grand valley, and from the tent they could see in all directions—east, west, north, and south—where there were green grasses in the river valley, sandy dunes stretching off in the distance, and a forest of trees as far as the eye could see. The valley and the magical creatures that lived there belonged to the family.

There were camels the color of jade; magical ibises with wings that spanned a meter and changed colors with the changing light of the day; fennec foxes with fluffy tails, each a different shade of blue depending on their age; and horses like none this world has ever seen. Their coats were soft as a newborn chick's and ranged in color from bright red to pale blue. Their eyes were like gemstones and their manes and tails shimmered with glittery accents.

It was Amir's job to take the horses and camels to the green river valley every morning. Sara, his little sister, fed the birds and took the foxes to the forest. Grandfather wanted to help Amir and Sara each day, but he was not feeling well and knew that soon he might not be able to. That day came one spring.

Grandfather awoke with a sore back and a stiff neck and could not walk outside to see the animals. He had to stay in bed, worrying about the animals and whether Amir and Sara were taking care of them correctly. Each day when they returned from feeding and caring for the animals, he would ask them questions. How many camels were there today? How many more ibises were there than foxes? How many horses still roamed in the valley?

All of this made Amir and Sara frustrated. They could not always recall the exact numbers and Grandfather wanted exact information. When they could not give it to him, he would get angry and say they were not doing their job, so Sara had an idea.

Sara told Amir that if they went out into the valley the next day and counted all the animals and recorded it in a bar graph, Grandfather would have all the information he wanted. He could see totals and he could compare one animal to another. It would make him happy until he was well enough to see for himself and it would make Amir and Sara happy to have him stop pestering them.

So the next morning, they went out into the valley and counted all of the adult animals and their young.

Camels: 30

Horses: 25

Ibises: 45

Fennec Foxes: 20

They made a bar graph and gave it to Grandfather, who was very, very pleased. He could now see all the information about his animals and answer all of the questions he had about them.

This kept Grandfather happy. Soon, the rest helped heal his back and neck and he was well enough to walk outside and look into the valley. He loved to watch his grandchildren take very good care of the animals they all loved.

The Magical Animals of Zioploris
Part 2

A few years passed in the land of Zioploris, and Grandfather was feeling strong. He decided to travel to the neighboring land of Miapoli to collect some new animals for the valley. He took Amir and Sara with him.

When they arrived in Miapoli, they saw amazing creatures of all sorts and sizes for sale in the market place. Grandfather let Amir and Sara each pick one type of creature and he picked two. Sara decided on winged cows that could fly over the valley looking for sweet grass. Amir decided on miniature goats that were just 60 centimeters tall. Grandfather chose golden sheep for their magical coats and a container of rainbow fish for the stream that ran through the valley floor.

Grandfather paid the merchants for the animals and they headed home to add the four new creatures to their valley.

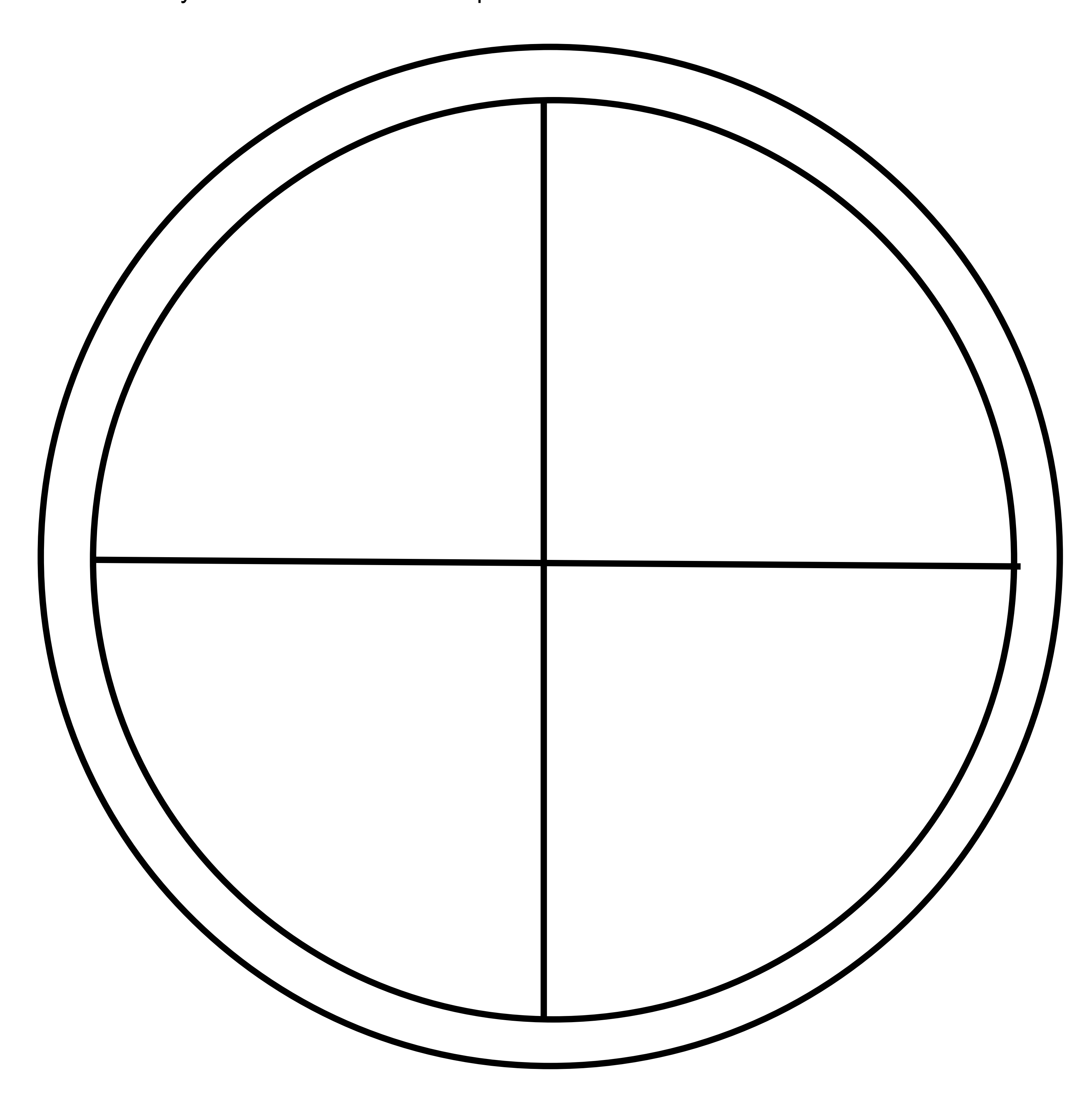
They brought back 8 winged cows, 15 miniature goats, 6 golden sheep, and 20 rainbow fish.

Now, each day, Grandfather, Amir, and Sara wake up early and walk outside their colorful tent to see the magical valley filled with creatures that make their hearts sing.

Pizza Fractions

DIRECTIONS: Color or draw the ingredients on the pizza based on the fraction given for each.

1. Add red sauce to the whole pizza.
2. Add green peppers to ¾ of the pizza.
3. Add black olives to ¼ of the pizza.
4. Add grey mushrooms to half of the pizza.
5. Add yellow cheese to **4/4** of the pizza.



Regrouping Game Cards and Answer Key

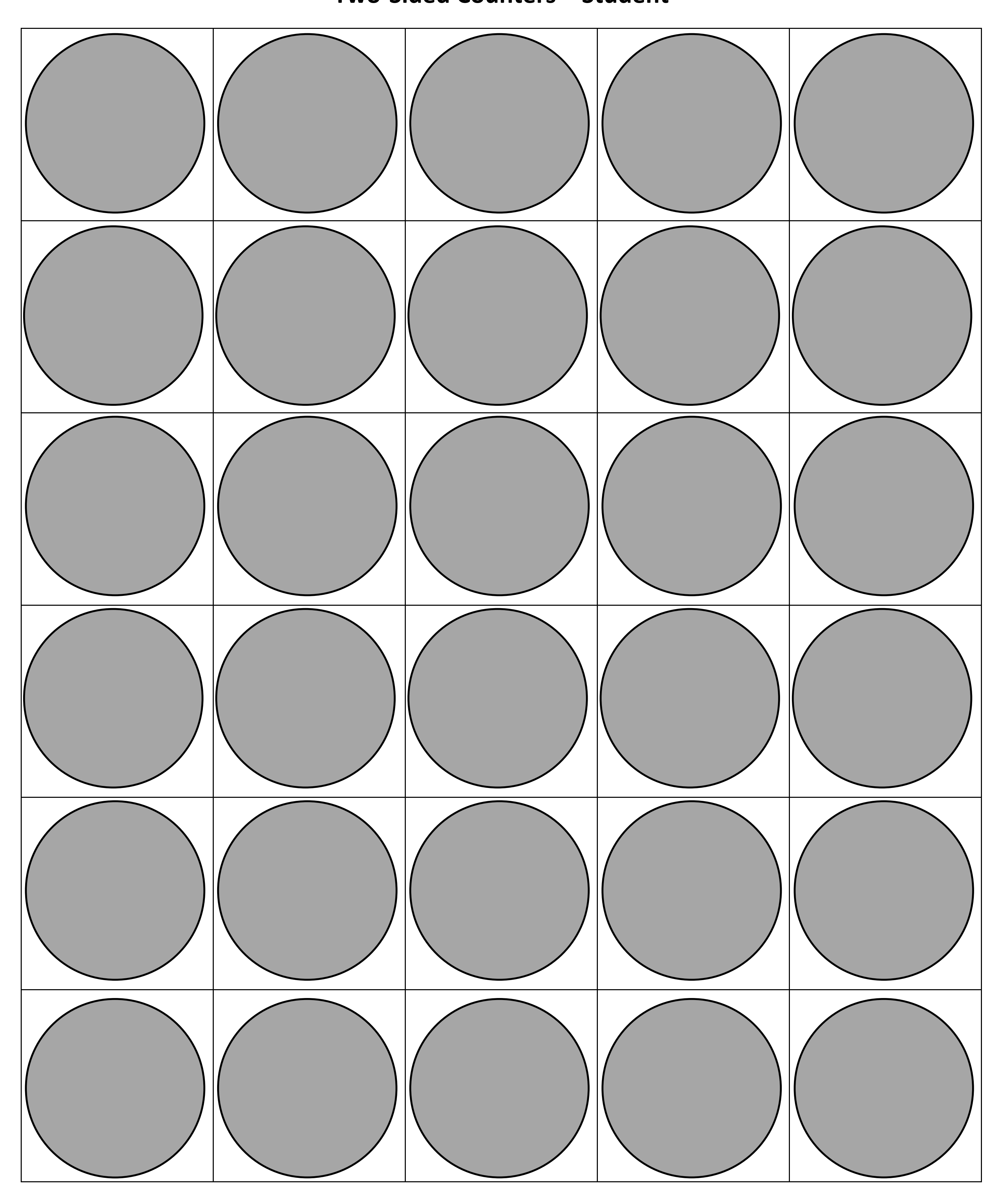
56 + 85 = 1	**123 + 85 =** 2
93 – 27 = 3	**150 – 75 =** 4
Omar had 345 stamps in his collection. He gave 28 stamps to his sister. How many stamps does he have left? 5	**Nada collected 67 shells at the beach. Aya collected 34 shells. How many shells did they collect in all?** 6
Lose a turn 7	**Move ahead 2 spaces** 8
76 + 124 = 9	**283 + 99 =** 10
200 – 68 = 11	**142 – 28 =** 12
309 + 235 = 13	**228 + 65 =** 14

93 – 35 = 15	**360 – 115 =** 16
Karim is 170 cm tall. His sister is 142 cm tall. How much taller is Karim than his sister? 17	**Yasmeen read 126 pages in January and 88 pages in February. How many pages did she read altogether?** 18
Go back 1 space 19	**Trade spaces with another player** 20
45 + 35 + 65 = 21	**79 + 299 =** 22
373 – 125 = 23	**91 – 38 =** 24
63 + 97 = 25	**274 – 126 =** 26
84 + 87 = 27	**140 – 75 =** 28
Marina saved 152 LE. She bought a new soccer ball for 129 LE. How much money does she have left? 29	**Walid bought 2 soccer balls. Each one cost 98 LE. How much money did he spend in all?** 30

Regrouping Game Answer Key

1) 141
2) 208
3) 66
4) 75
5) 317 stamps
6) 101 small items
7) Lose a turn
8) Move ahead 2 spaces
9) 200
10) 382
11) 132
12) 114
13) 544
14) 293
15) 58
16) 245
17) 28 cm taller
18) 214 pages
19) Go back 1 space
20) Trade spaces with another player
21) 145
22) 378
23) 248
24) 53
25) 160
26) 148
27) 171
28) 65
29) 23 LE left
30) 196 LE

Two-Sided Counters – Student



Banknotes



Central Bank of Egypt
1
Specimen
ONE POUND



Central Bank of Egypt
1
Specimen
ONE POUND



Central Bank of Egypt
1
Specimen
ONE POUND


Central Bank of Egypt
1
Specimen
ONE POUND

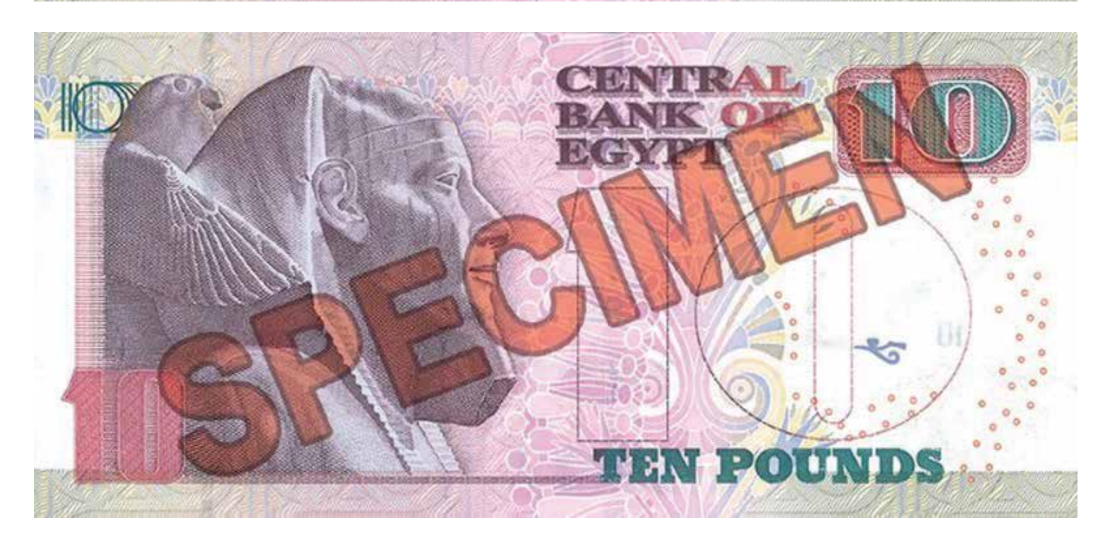

Central Bank of Egypt
1
Specimen
ONE POUND


Central Bank of Egypt
5
FIVE
POUNDS
SPECIMEN


Central Bank of Egypt
FIVE POUNDS
5
5
SPECIMEN
Central Bank of Egypt
FIVE POUNDS
5
5
SPECIMEN
Central Bank of Egypt
FIVE POUNDS
5
5
SPECIMEN


Central Bank of Egypt
5
FIVE
POUNDS
5
SPECIMEN


CENTRAL
BANK OF
EGYPT
10
SPECIMEN
TEN POUNDS


CENTRAL
BANK OF
EGYPT
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Central Bank of Egypt
20
TWENTY POUNDS
20
SPECIMEN



Central Bank of Egypt
20
TWENTY POUNDS
20
SPECIMEN



Central Bank of Egypt
20
TWENTY POUNDS
20
SPECIMEN


CENTRAL BANK OF EGYPT
FIFTY POUNDS
SPECIMEN
50
L.E.
50
POUNDS


CENTRAL BANK OF EGYPT
FIFTY POUNDS
SPECIMEN
50
L.E.
50
POUNDS


CENTRAL BANK OF EGYPT
FIFTY POUNDS
SPECIMEN
50
L.E.
50
POUNDS


100
CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100 POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100 POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE

Estimating Sums and Differences Cards

A	B	C
68 + 21	120 + 340	56 + 31
D	**E**	**F**
84 – 43	290 – 110	470 – 260

I	J	K	L
75 + 38	270 + 310	96 + 23	110 – 38

M	N	O	P
690 – 320	230 – 190	65 + 12	160 – 99

Money Story Problem Cards

A	B
Omar had 750 LE saved for a bike. The one that he wants costs 625 LE. After he buys the bike, how much money will he have left?	Farah went to the market. She bought some beef for 65 LE, some chicken for 38 LE, and some milk for 53 LE. How much money did she spend in all?
C	**D**
Mina’s grandmother gave her and her brother Kareem money for their birthdays. She gave each child 125 LE. How much money did Mina’s grandmother give in all?	Tarek and his friend Karim both bought new footballs. Tarek’s football costs 189 LE and Karim’s football costs 425 LE. How much money did both boys spend on their footballs?
E	**F**
Amir made 990 LE working for a small company. He bought himself some new pants for 700 LE. How much money does he have left?	Nadine saved 820 LE. She wanted to buy a pair of jeans. The jeans cost 790 LE. How much money will she have left?

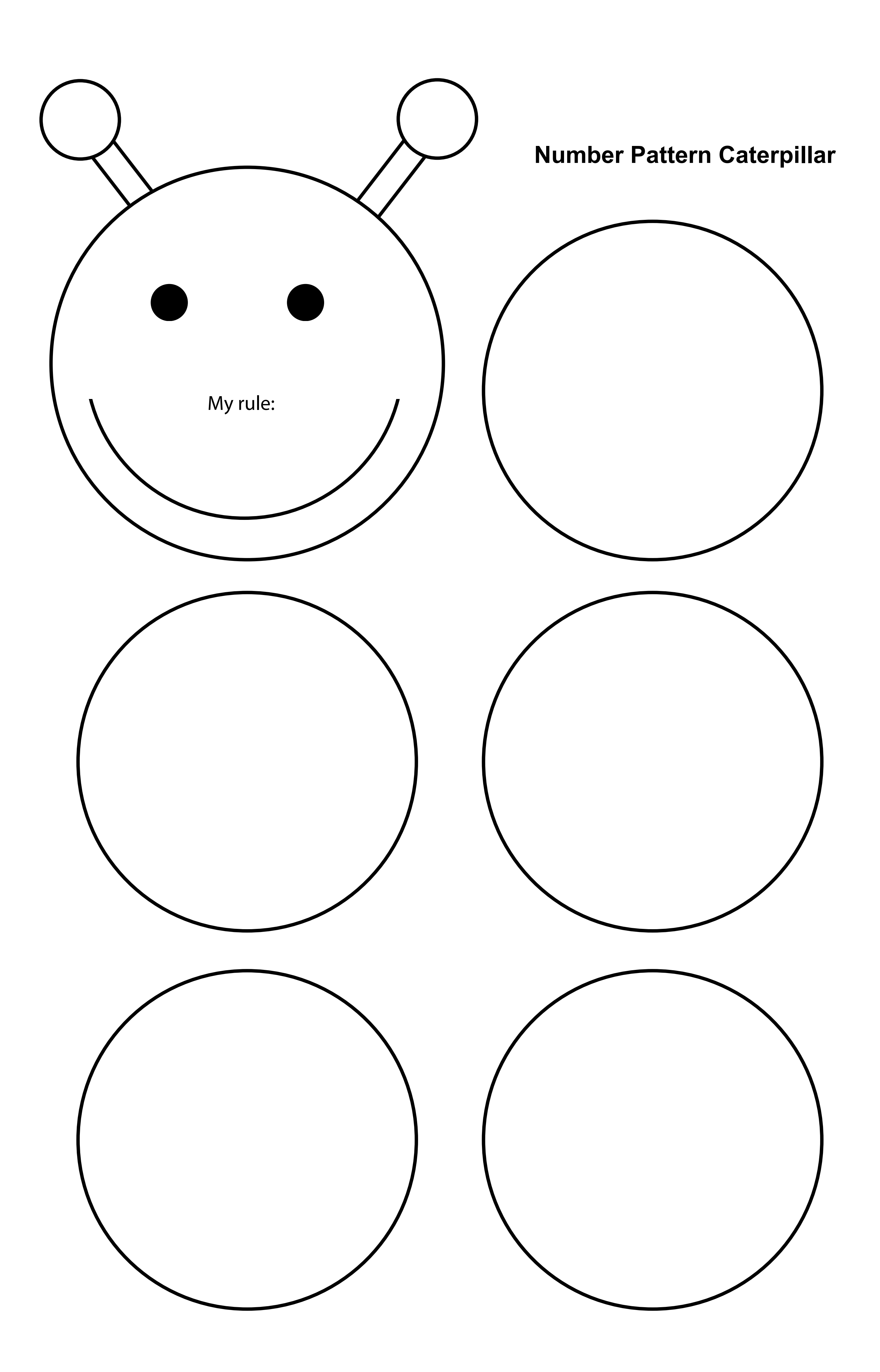
Number Cards 0-9

0	1	2
3	4	5
6	7	8
9		

Number Cards 1-10

1	2	3
4	5	6
7	8	9
10		

Number Pattern Caterpillar



Pattern Rule Cards

Rule: + 10 **Start at 30**	**Rule: - 10** **Start at 90**
Rule: + 5 **Start at 65**	**Rule: - 5** **Start at 70**
Rule: + 2 **Start at 10**	**Rule: - 2** **Start at 30**
Rule: + 1 **Start at 20**	**Rule: - 1** **Start at 20**
Rule: + 3 **Start at 15**	**Rule: - 3** **Start at 15**

Large Banknotes








Central Bank of Egypt
1
Specimen
1
ONE POUND


Central Bank of Egypt
1
Specimen
1
ONE POUND


Central Bank of Egypt
5
FIVE
POUNDS
5
SPECIMEN


Central Bank of Egypt
FIVE
POUNDS
5
5
SPECIMEN


Central Bank of Egypt
FIVE
POUNDS
5
5
SPECIMEN


Central Bank of Egypt
FIVE
POUNDS
5
5
SPECIMEN


Central Bank of Egypt
FIVE
POUNDS
5
SPECIMEN


CENTRAL
BANK OF
EGYPT
10
TEN POUNDS
SPECIMEN


CENTRAL
BANK OF
EGYPT
10
TEN POUNDS
SPECIMEN


CENTRAL
BANK OF
EGYPT
10
SPECIMEN
TEN POUNDS


CENTRAL
BANK OF
EGYPT
10
SPECIMEN
TEN POUNDS


CENTRAL
BANK OF
EGYPT
10
SPECIMEN
TEN POUNDS


Central Bank of Egypt
TWENTY POUNDS
20
SPECIMEN


Central Bank of Egypt
TWENTY POUNDS
20
SPECIMEN


Central Bank of Egypt
TWENTY POUNDS
20
SPECIMEN


CENTRAL BANK OF EGYPT
FIFTY POUNDS
SPECIMEN
50
L.E.
50
POUNDS


CENTRAL BANK OF EGYPT
FIFTY POUNDS
SPECIMEN
50
L.E.
50
POUNDS


100
CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


CENTRAL BANK OF EGYPT
100
POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100 POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE


100
CENTRAL BANK OF EGYPT
100 POUNDS
SPECIMEN
ONE HUNDRED POUNDS
100
LE

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